Loading Roll Paper in Rail Cars

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SECTION I - INTRODUCTION

WHY THIS PUBLICATION EXISTS

This publication provides the user with information regarding best practices for loading roll paper in boxcars for transportation across the North American Rail System.

Prior to the development of this publication a Quality Lead Team (QLT) of representatives from the paper manufacturing industry and the rail transportation industry, studied the problems responsible for causing damage. The Quality Lead Team feels it is impossible to determine the direct cause of damage problems due to variations in methodology used by manufacturers during preparation for shipment in boxcars.

To remain competitive in today’s market place it is incumbent upon the shipper, carrier, and receiver to make sure that products are handled safely and without damage. During the transportation cycle, each party must understand that there are characteristics unique to the environment of the other parties in the cycle.

The shipper has unique problems associated with space, cost, efficiency, and operating methods that are unique to that location. Likewise, the rail carrier has similar constraints. To this is added the natural occurring environment in which the rail carrier must operate. Last but not least, the receiver has to live with various time constraints and operating parameters.

We have created a publication containing best practices methodology for use in shipping roll paper. The load patterns and specifications herein were subjected to testing in the field or through simulation testing at the AAR’s Transportation Technology Center. The methods illustrated are provided to give the shipper, carrier and receiver answers to the age old question as to what is the best way to ship roll paper. Other loading methods are acceptable, provided they conform to minimum safe loading and car preparation practices as defined in Circular No. 42-J or supplements thereto. These are minimum standards as tested. Individual shippers may find it helpful to supplement these standards as their shipping experience dictates.

This updated release contains information on loading roll paper in the following diameters: 40", 42", 45", 50", 58", 60", 65", 72" and 84". A limited amount of information is also presented on other diameters. The Quality Lead Team will continue to develop methods for additional diameters. We will release this information periodically to allow the user to upgrade the base of information provided.

Coincident to this publication the Quality Lead Team is working on ways to evaluate loading methods that are in use to help weed out those which are not performing adequately. This may result in the removal of some methods should performance data show they are not performing adequately.

We hope that this book will help answer some of the questions you have had regarding proper loading practices for roll paper. We know we have not covered every possible situation, however, we think you will find this book extremely useful.
How to Use:

The book is broken into eleven sections and each one has a specific purpose.

Section 1 - Introduction—This section contains the why’s, how’s, and who’s of this book.

Section 2 - Safety—Here we provide some specific requirements you need to know to ensure the safe operation of the railroad over which your product will travel. This includes load balance and center of gravity.

Section 3 - Car Condition and Type—This section will help you understand rail equipment and how to determine whether or not a car is suitable for loading paper.

Section 4 - General Packaging, Loading and Securement Information—This section contains information on various dunnage and securement materials and loading principles that you will find illustrated in later sections of the book. Most of these items are systemic to the various loading methods. Therefore the information about these materials is illustrated only once in the book. Details about the use of the materials is also contained in this section.

Section 5 - Doorway Protection—This section identifies when doorway protection is required. This section is extremely important since it will help provide safe protection for employees and the general public as well as helping to ensure that damage to equipment and lading is eliminated through the use of proper applications.

Section 6 - Load Patterns—This section contains specific load patterns. These are arranged by diameter, car size, number of floor spots, and by securement method. This section will expand during coming months as figures are added for other roll diameters.

Section 7 - Glossary—This section explains terms used throughout this book.

Section 8 - Analysis—This section is reserved for future use in providing the owner of this manual with information regarding damage problems and performance data on various load patterns, securement materials, and diameters.

Section 9 - This section contains the following documents:

AAR Circular No. 42-K
AAR DP & FC Rule of Order X

Section 10 - Damage Prevention Product Vendor List

Section 11 - Pamphlet No. 39
Supplemental Loading Standards for Roll Paper/Pulpboard in Closed Cars
Submission of New Loading Methods:

While we have tried to make sure we have included as many variables as possible in this book, we realize that individual needs will dictate variations to generally accepted loading practices. When you vary from the methods shown in this book, contact your serving carrier to determine whether or not these variations will perform adequately in the rail environment. In some cases, loading methods are accepted by mutual agreement of the carriers involved in the movement of the loads in question.

In order to make sure that loading methods shipped via rail are effective, the Association of American Railroads has a long established procedure for evaluating loading and securement. This procedure is recognized as the main authority for universal acceptance of loading and securement methods throughout the North American rail system.

In many cases further evaluation is warranted. If you desire additional evaluation, you should submit proposals to the Association of American Railroads for evaluation. Under their Rule of Order X, submissions will receive evaluation for potential effectiveness. A copy of the AAR’s Rule of Order X is included in Section 9 of this book. A copy of the Test Request Form is also found in Section 9.

Send submissions to:
Senior Manager, Damage Prevention Engineering
AAR/TTCI
Damage Prevention and Loading Services
7001 Weston Parkway, Suite 200
Cary, NC 27513
FAX No.: (919) 651-5405
SECTION 2—SAFETY

The General Rules relating to personal safety and safe operation of trains, contained in AAR Circular No. 42-K, or supplements thereto, approved by the Damage Prevention & Freight Committee of the Association of American Railroads must be observed.

A. GENERAL RULES:

A.1 Each individual company has their own set of safety rules. Make sure you follow those that are applicable in your facility.

A.2 In general, you must be careful around railroad equipment. If you are unfamiliar with the proper way to operate equipment, check with your supervisor and obtain the proper training needed to safely do your job.

B. CENTER OF GRAVITY:

CAUTION: Car rocking motion caused by lift equipment entering and/or exiting the rail car may cause unsupported packages or articles with a high center of gravity to fall to the floor. Minimize access to the car. Exercise caution when inside a partially loaded car. Lift operators should stay on lift equipment, whenever possible, while inside a partially loaded car.

The following guidelines are reproduced here to help determine whether or not the center of gravity of the rail car and lading is safe for movement. Check with your serving railroad for assistance (See Section 2—Page 2).

Center of Gravity

Combined center of gravity of rail car and contents must not exceed 98" above top of rail. In closed cars there is no practical possibility of exceeding this center of gravity limitation except in cars which exceed Plate C dimensions.

Cars exceeding Plate C dimensions may extend to 17 feet above top of rail. Certain lading such as rolled paper, when loaded two layers high may result in excessive combined center of gravity dimensions. Shippers are to calculate the combined center of gravity of the rail car and contents whenever any part of the load will exceed 11 feet 8 inches (140") in height above the car floor. Shipper’s tender of billing information for such cars to the origin carrier will signify compliance with this rule. Any questions on loading limitations in cars exceeding Plate C dimensions should be handled with the Mechanical Department of the origin carrier.

Use the following formula to calculate the combined center of gravity.

\[
A = \text{Height of car floor above top of rail in inches.}
\]
\[
B = \text{Empty center of gravity of rail car above top of rail in inches, obtainable from car owner. (Empty center of gravity may be stenciled on the rail car.)}
\]
\[
C = \text{Center of gravity of load above car floor in inches.}
\]
\[
D = \text{Height of center of gravity of load above top of rail, equal to } A + C.
\]
\[
E = \text{Lightweight of rail car in pounds.}
\]
\[
F = \text{Weight of load in pounds.}
\]

\[
\text{Combined Center of Gravity (CG)} = \frac{(B \times E) + (D \times F)}{(E + F)}
\]
NOTE: The following table may be used as a guideline when determining A in the above formula:

<table>
<thead>
<tr>
<th>Weight of Load (Pounds)</th>
<th>Spring Deflection</th>
</tr>
</thead>
<tbody>
<tr>
<td>122,000 – 137,000</td>
<td>1.00 inches</td>
</tr>
<tr>
<td>138,000 – 164,000</td>
<td>1.25 inches</td>
</tr>
<tr>
<td>165,000 – 191,000</td>
<td>1.50 inches</td>
</tr>
<tr>
<td>192,000 – 207,000</td>
<td>1.75 inches</td>
</tr>
</tbody>
</table>

EXAMPLE: Roll Paper

Load:  
(a) 9 rolls or stacks of rolls @ 13,000 lbs. ea. 151" wide (tall)  
(b) 9 rolls or stacks of rolls @ 7,600 lbs. ea. 76" wide (tall)

Note: When load consists of multiple sections or units having different unit heights and weights such as (a) and (b) above, each section or unit must be taken separately when calculating the CG of the load.

A = 44"  
B = 58"  
C = (a) 151"/2 = 75.5"  
(b) 76"/2 = 38"  
D = (a) 75.5" + 44" = 119.5"  
(b) 38" + 44" = 82"  
E = 72,800 lbs.  
F = (a) 9 x 13,000 lbs. = 117,000 lbs.  
(b) 9 x 7,600 lbs. = 68,400 lbs

\[
\text{Combined}(CG) = \frac{(B \times E) + [D(a) \times F(a)] + [D(b) \times F(b)]}{E + F(a) + F(b)}
\]

\[
= \frac{(58 \times 72,800) + (119.5 \times 117,000 + 82 \times 68,400)}{72,800 + 117,000 + 68,400}
\]

\[
= \frac{4,222,400 + 13,981,500 + 5,608,800}{258,200}
\]

\[
= \frac{23,812,700}{258,200}
\]

= 92.23" above top of rail
SECTION 3: CAR CONDITION AND TYPE

It is extremely important to ship roll paper in suitable equipment. Careful inspection and vehicle preparation are key elements to damage-free transportation of paper.

1. It is the railroad’s responsibility to supply cars which are clean, have sound roofs, sides and square end walls, smooth floors and snug fitting doors. Any exception is cause for rejection. The shipper has the responsibility to inspect interiors of cars to see that they are suitable to carry lading safely and damage-free.

2. Before attempting to open the doors of any rail car, check to make sure that all hardware is intact so you can open the door safely. Check the door tracks to make sure they are equipped with stops on the ends so the door doesn’t fall off when opening.

   — It is very critical to check locking bars and related hardware to make sure you can safely open plug doors.

   — Make sure the door is operating properly before fully opening the door. There is always the possibility that material or lading may be leaning against the car’s doors or applying pressure.

   — Use extreme care when opening any type of rail car door to protect against injury.

3. Always check the vehicle to see if there is a possibility of water entering into the vehicle. Water can easily enter a vehicle with a result of product damage. Make sure that the car is water tight. Look for light leaks or evidence of new or large amounts of rust which may indicate recent water entry into the vehicle.

   (Note: It is extremely important that when a customer receives a rail car with any water damage, the carriers involved are notified immediately to make sure the car is shopped and repaired before a repetition of the problem occurs.)

4. Inspect the vehicle for any protrusions, rough, broken, or bent surfaces that could result in damage to product. It is important that vehicles are clean and free from nails, brads, staples, temporary anchor plates, fragments of steel and dunnage remnants. To prevent damage, cover projections of lining or anchor devices with protective materials taped in place or otherwise adequately secured.

5. Check the end walls to make sure they are not bowed. If the end wall is severely bowed you should reject the car. If they are bowed and you need to use the car, you will need to use materials of appropriate size and strength to bring the end walls back to square. This will help to ensure that the load remains tight during its journey.

6. Check the car floors for any holes or rough surfaces that may result in leakage or damage to the product.

7. Inspect the car doors to make sure they close tightly and can be secured properly.

8. Any deficiencies listed above may be cause for rejecting the rail car back to the railroad. If the shipper elects to load cars with these deficiencies, the shipper is then responsible for temporary repairs bringing the rail car to an acceptable level of quality.
The loading methods illustrated in this book have a proven track record of success in specific car types. Please note the type of car for which each method is used. Failure to use the proper loading method in the proper type of equipment will result in damage to product and a dissatisfied customer. (i.e.—If a loading method is shown for use in a cushion equipped car, use that loading method only in cushion equipped cars.)

Car specifications are dictated by customer requirements. Each shipper and their carrier works together to develop the specifications for equipment required for shipping their products.
SECTION 4 - GENERAL PACKAGING, LOADING AND SECUREMENT INFORMATION

A. WRAPPING OF ROLLS-

Most paper shipped via rail is wrapped. In general liner board, corrugating medium, and similar types of paper are not wrapped and the outer plies are considered the protective wrap for these types of rolls. Newsprint and printing papers are in most cases wrapped to protect all of the paper on the rolls.

A.1 Wrap all rolls tightly with quality scuff and tear resistant mill wrapper with edges securely glued. The wrapper extends past both ends of the roll and is crimped evenly over the ends. You may wish to use one end band on each end. Double wrap or paper of sufficient strength that is scuff and tear resistant is usable in place of end bands.

A.2 Use inner and outer headers on both ends of the roll.

Illustration No. 1
Wrapped Rolls With Headers
B. CORES AND CORE PLUGS-

The Association of American Railroads has conducted environmental studies (See AAR Report No. DP 7-92—Study of the Shock and Vibration Environment in Boxcars) that show that longitudinal shocks are more severe in standard draft gear cars as opposed to cushion equipped cars. This report also shows that peak longitudinal acceleration levels may exceed 2 g’s in various locations in the rail car.

Core strength is a highly sensitive topic among shippers, carriers, and receivers. It is extremely important to use cores and packaging materials of sufficient strength to properly protect roll paper in the railroad environment.

Use protective metal tips, plugs or metal inserts with plugs to increase the strength of cores not made of steel. In some instances you may find it necessary to use plugs in combination with metal tips to provide adequate strength. The following illustrations show different core and core plug types. Core plugs are available that are made of wood, wood composite, plastic, or metal. Suggested size of the bevels on the plugs is 3/8".
C. STEEL AND SYNTHETIC STRAP DATA-

Steel Strap-

C.1 The combined joint strength of the number of straps for rigid braced loads, in each longitudinal impact direction, must equal the weight of the lading secured, except as shown in approved loading figures.

C.2 Use the proper combination of steel straps, seals, sealing tools, notches or crimps to provide the minimum joint strength for sizes listed below. See Illustration for examples of notches or crimps.

<table>
<thead>
<tr>
<th>Width &amp; Thickness Inches</th>
<th>Width &amp; Thickness Millimeters</th>
<th>Minimum Breaking Strength-Pounds</th>
<th>Minimum Joint Strength - Pounds</th>
<th>Recommended Minimum No. of Pairs of Notches on Joint - All Surface Finishes</th>
<th>Recommended Minimum No. of Pairs of Crimps on Joint - Surface Finish - Bands</th>
</tr>
</thead>
<tbody>
<tr>
<td>1(\frac{1}{4}) x .029</td>
<td>32 x .75</td>
<td>4,750</td>
<td>3,565</td>
<td>2</td>
<td>3, 3, 3, 4</td>
</tr>
<tr>
<td>1(\frac{1}{4}) x .031</td>
<td></td>
<td>4,750</td>
<td>3,565</td>
<td>2</td>
<td>3, 3, 4</td>
</tr>
<tr>
<td>1(\frac{1}{4}) x .035</td>
<td></td>
<td>4,750</td>
<td>3,565</td>
<td>2</td>
<td>3, 3, 4</td>
</tr>
<tr>
<td>1(\frac{1}{4}) x .044</td>
<td></td>
<td>6,750</td>
<td>5,065</td>
<td>4</td>
<td>4, 4, 4, 4</td>
</tr>
<tr>
<td>1(\frac{1}{4}) x .050</td>
<td></td>
<td>6,750</td>
<td>5,065</td>
<td>4</td>
<td>4, 4, 4, 4</td>
</tr>
<tr>
<td>2 x .044</td>
<td></td>
<td>10,600</td>
<td>7,950</td>
<td>4</td>
<td>4, 4, 4, 4</td>
</tr>
<tr>
<td>2 x .050</td>
<td></td>
<td>10,600</td>
<td>7,950</td>
<td>4</td>
<td>4, 4, 4, 4</td>
</tr>
<tr>
<td>2 x .065</td>
<td></td>
<td>13,800</td>
<td>10,350</td>
<td>4</td>
<td>4, 4, 4, 4</td>
</tr>
</tbody>
</table>

*Grit Seals Only. 6 Pairs Required for Non-grit Seals.

C.3 The number of notches or crimps shown in the table are based on current general information of high-tension strapping manufacturers on the basis that tensioning and sealing tools are in proper operating condition.

C.4 Make sure that tensioning and sealing equipment is used properly. Check the tools periodically to ensure their efficiency.

C.5 Use protective material between lading and steel straps to prevent damage.

C.6 Several illustrations in this book refer to the use of strap holders as a means of maintaining horizontal alignment of strapping. Steel strap, tape, wire, or twine inserted into the cores or attached to core plugs are acceptable materials for use as strap holders.
C.7 AAR Circular No. 42-K, General Rules Covering Loading of Carload Shipments of Commodities in Closed Cars, (Rule 6, Loading, Blocking and Bracing—Box Cars) contains a list of manufacturers and suppliers whose products have been tested by AAR and found to meet the requirements. Circular No. 42-K can be found in Section 9.

Illustration No. 3
Steel Strap Seal Applications
**Non-Metallic Strap**

C.8 You may use approved non-metallic strap for load securement only when specified in applicable loading illustrations.

C.9 There are several illustrations in this book that show the use of non-metallic strap for key banding and unitizing. Follow the guidelines provided with each illustration to ensure the effective performance of the non-metallic strap.

C.10 The following illustration shows the proper application of one of the types of buckles used with non-metallic strap.

![Illustration of non-metallic strap application](image)

Illustration No. 4
Synthetic Strap Buckle Application
D. LENGTHWISE VOIDS-

D.1 Fill lengthwise voids in all loads of paper.

D.2 You may use two roll key-lock and five roll unit straps to eliminate lengthwise voids in loads of NEWSPRINT when rolls are loaded in a 2-1-2 pattern. Use strap holders to keep straps in position.

D.3 You can use an AAR verified disposable inflatable dunnage bags (D.I.D.) to fill lengthwise voids. Specific bag types and applications are found in Section 6 - Load Patterns. When D.I.D. bags are used to fill lengthwise voids and secure rolls against lengthwise movement, the following steps are suggested:

DISPOSABLE INFLATABLE DUNNAGE (D.I.D.) - GENERAL INFORMATION

Disposable inflatable dunnage bags are a cost effective method of securing roll paper to prevent damage. Disposable inflatable dunnage bags must meet the requirements of the Association of American Railroads as set forth in AAR General Information Bulletin No. 9, "Product Performance Profile for Pneumatic Dunnage (PPPPD).

a. Dunnage bags come in various sizes and types. D.I.D. bags that have successfully completed testing under AAR General Information Bulletin No. 9, will be verified by Levels 1-5 (designating use by specific load weights) and listed on the TTCI web site - AAR.com.

b. The following are allowable load weights for each Level under AAR General Information Bulletin No. 9.:

(1) Level 1 - Used for lateral void fillers in intermodal shipments only.
(2) Level 2 - Applied for lengthwise voids between flat surfaces in boxcars for load weights less than 75,000 lbs.
(3) Level 3 - Applied for lengthwise voids between flat surfaces in boxcars for load weights between 75,001 lbs and 160,000 lbs.
(4) Level 4 - Applied for lengthwise voids between flat surfaces in boxcars for load weights between 160,001 lbs and 205,000 lbs.
(5) Level 5 - Applied horizontally for lengthwise voids between concave surfaces in boxcars for load weights between 160,000 lbs and 205,000 lbs.

c. Bags are to be capable of holding 3 PSI in an unrestrained state and not lose over 0.5 PSI in 14 days.

d. The dunnage bag shall not burst or show any evidence of leakage when pressurized to not less than 25 PSI restrained for one minute in an 11 inch void.

It is very important to follow the manufacturer's instructions on care and storage of D.I.D. bags prior to use. By not doing so bags can weaken at the seams when folded over causing slow leaks after inflation, rendering them ineffective in transit. Also improper filling of the bags can lead to an air burn in the bladder at the filler area, again causing a leak. Each D.I.D. bag manufacturer may produce valves unique to their product and therefore it is important to use the manufacturer recommended inflator tool. It is also important to use clean dry air when filling the bag and an air gauge that is accurate to insure proper air pressure is achieved. Do not rely in the "thump" test as an indication the bag is properly inflated. Recheck air pressure a half hour after installation to insure the bag is not leaking, or that load settling has not resulted in pressure loss.
**Vertical Bag Applications** - *placed vertically between rolls or buffer pads:*

a. Use bags to fill voids from 4" to 12" (after inflation) to insure maximum performance.

b. Use bags of appropriate size as defined in each loading illustration in Section 6 - Load Patterns.

c. D.I.D. bags should be a minimum of 2/3's the height of the adjacent stacks they are securing. They should not exceed the height of the lading when positioned 1" above car floor.

d. Inflate D.I.D. bags to 8 psi.

---

**Illustration No. 5**

*Vertical Bag Application in Load of Newsprint*
**Contour Buffer Pads - Vertical Bag Applications**

e. Contour buffer pads are designed to help prevent the displacement of D.I.D. bags.

f. Buffer pads are placed on each side of the voids.

g. The contour side of the pads face the rolls with the flat side adjacent to the D.I.D. bags.

h. Use buffer pads that are at least as tall as the D.I.D. bags used.

i. Minimum crush strength of 4,500 lbs/ft² is required for buffer pads.
Void Fillers - (Vertical Bag Applications)

j. Use appropriate void fillers so that dunnage bags will not fill more than 12" of void after inflation.

k. Use void fillers that are the same height as the contour buffer pads when adjacent to D.I.D. bags.

l. Minimum crush strength of 2,250 lbs/ft$^2$ is required for void fillers.

m. Contour buffer pads are required in most instances if void fillers are used adjacent to D.I.D. bags. Do not use any more than three void fillers on either side of the D.I.D. bag at one time. Use of more than three void fillers has proven unstable and may lead to the total breakdown of the load with resultant damage. You could place the void fillers in other locations within the load. This scenario is dictated by car size and roll diameter variations. See appropriate load diagram in Section 6 - Load Patterns.

Illustration No. 7
Void Fillers Used with Vertical D.I.D. Bags and Contour Buffer Pads
Horizontal Bag Applications - placed horizontally between rolls or buffer pads:
You can use an AAR verified disposable inflatable dunnage bags (D.I.D.) to fill lengthwise voids in horizontal applications. Only Level 5 D.I.D. air bags, as verified by successfully completing testing under AAR Product Performance Profile for Pneumatic Dunnage requirements, are permitted in this application. Specific bag types and applications are found in Section 6 - Load Patterns. When D.I.D. bags are used to fill lengthwise voids and secure rolls against lengthwise movement, the following steps are suggested:

n. D.I.D. bags should be a minimum of 2/3’s the height of the adjacent stacks they are securing.

o. Use one D.I.D. bag per layer unless specifically shown in Section 6 - Load Patterns.

p. Use D.I.D. bags to fill voids from 4” to 12” (after inflation) to insure maximum performance.

q. Use D.I.D. bags of appropriate size as defined in each loading illustration in Section 6 - Load Patterns.

r. Make sure D.I.D. bags do not exceed height of rolls when positioned 1” above car floor.

s. Inflate D.I.D. bags to 8 psi unless otherwise specified in an additional load diagram in Section 6 - Load Patterns.
t. The use of contour pads for horizontal D.I.D. bag application is only needed when you want to reduce the size of the void filled by the bag or when you are using a single D.I.D. bag to cover more than one layer.

u. When using the contour pads to reduce void size use void fillers in conjunction with the contour pads. Do not use more than three void fillers together on any one side of the D.I.D. bags. The use of more than three pads has proven unstable during testing and could lead to the breakdown of the securement system and product damage. Again, void fillers could be placed in other locations within the load.

**Void Fillers** -

v. When using void fillers within the load to take up lengthwise voids, use filler material whose height is at least 50% of the height of adjacent rolls or covers sufficient height of multiple layers to minimize rocking.

w. Minimum crush strength of 2,250 lbs/ft² is required for void fillers.

x. Secure void filler to adjacent roll if there is a possibility of displacement of the void filler during transit.

y. Do not use more than three fillers in any one lengthwise void location.

D.4 In pulpboard loads lengthwise voids can be taken up by using an end wall spacer on the floor between the second roll loaded and the end wall of the car. (See Illus. No. 9). This prevents the rolls from bypassing each other and becoming wedged at the end.
Another method is to use honeycomb spacers on the sidewall of the car adjacent to the first roll loaded. (See Illus. No. 10).

Illustration No. 10
Honeycomb Filler along Sidewall in Pulpboard Load

Wooden 2x4’s and 2x6’s (in cushion equipped cars) or corrugated material can also be used to reduce lengthwise void space. They can be positioned on the floor along the sidewall adjacent the end wall, and used on the floor in the doorway area. (See Illus. No. 11).

Illustration No. 11
Wooden 2 X 4’s and 2 X 6’s used as Lengthwise Fillers in Cushion Equipped Cars
E. INCOMPLETE LAYERS -

E.1 Secure incomplete layers by using blocking rolls. The blocking roll should contact at least 50% of the width of the incomplete layer they are blocking.

E.2 If blocking rolls contact less than 50% of the height of rolls they are blocking, the following are guidelines to use:

a. Use one $1\frac{1}{4}$" x .031" steel strap or equivalent unitizing strap around the incomplete layer or approved non-metallic strap.

b. Blocking rolls must extend at least 6" above the bottom of the incomplete layer. When all rolls are of equal width, you can accomplish this by using risers. Crush strength of these risers is as follows:

- 6,000 lbs/ft² if a single layer is placed on the risers.

- 9,000 lbs/ft² if two or more layers or heavy rolls are placed on the risers.

c. You can use risers of different designs as long as their load carrying capacity is equal to the capacities specified for the risers illustrated. These risers must prevent roll tipping and must be a minimum of 6" in height.

d. Use strap holders to keep unitizing straps in position.

Illustration No. 12
Partial Top Layer with Risers and Blocking Rolls
The following is for use in rigid braced (i.e., wall anchored loads of newsprint or similar types of paper) unless otherwise exempted by specific loading figure.

E.3 Wall anchored partial top layer in rigid braced loads.

- a. Use two 1\(\frac{1}{4}\)" x .031" steel straps or equivalent anchored to the sidewalls at least 3' behind the load face.
- b. The straps are attached to permanent wall anchors.
- c. In the case of wood lined cars not equipped with permanent anchor plates, the strap is wrapped around the anchor plate and nailed to the sidewall of the car at a side post in the car sidewall.
- d. This is accomplished by placing the first strap at the center of the rolls and the second strap one-quarter of the height from the bottom of the rolls.
- e. A unitizing strap (1\(\frac{1}{4}\)" x .031" steel strap or equivalent material) encircling all upper rolls in each end of the car, is placed one-quarter of the roll height from the top of the rolls.
- f. Use strap holders to keep the straps in position.
F. RISERS

F.1 As mentioned in E. (Incomplete Layers), risers are used to raise blocking rolls within loads. Risers are to be placed under the rolls and lengthwise in the rail car as indicated in Illustration No. 14.

F.2 Risers should be a minimum of 6" x 5" x 30" corrugated fibreboard or equivalent material.

F.3 In double layer loads, risers are used under the fifth stack to break the strata line. This maintains roll alignment and prevents overlapping of rolls.
SECTION 5: DOORWAY PROTECTION

A. PURPOSE:

Doorway protection is required to prevent rolls from moving into and through the doorway during transit. Such roll movement may result in pressure building up against the door which is a safety concern during transit and unloading. The pressure could result in bulged doors, doors being pushed open and doors which lose their weather seal protection.

The doors are not intended to be considered as blocking and bracing mechanisms nor to provide load restraint. Rail car doors do not absorb pressure that rolls may place against them. The door locks are designed only for security.

Only loading patterns which utilize protection in accordance with AAR Circular No 42-K or revisions thereto, this “Best Practices Manual”, AAR Pamphlet 39, or AAR GIS series publications are acceptable. The requirements listed in these publications are considered minimum standards.

The requirements listed below will protect the interests of shippers, rail carriers and receivers.

B. RULE 7 OF RAIL CARRIERS MANDATORY SAFETY CIRCULAR 42-K IS QUOTED BELOW:

When there is the possibility of lading falling or rolling out of doorway or coming in contact with sliding or plug type side doors, opening must be protected with wood doorway protection, steel straps or other material of sufficient strength and number and adequately secured. Cars equipped with plug doors loaded with cylindrical items such as rolls of paper or drums require doorway protection unless specifically exempted by applicable commodity pamphlets.

C. WHAT ELSE IS REQUIRED?

In addition to the doorway requirements listed in this manual, ensure care is taken to:

a) Load rolls with methods that tighten the load lengthwise in the car to prevent sideways movement of rolls.

b) Do not use dunnage materials as a spacer between the car doors and the rolls.

c) Ensure there is space left between the rolls and the doors.
D. DOORWAY PROTECTION FOR ROLL PAPER PRODUCTS:

D.1: Across Doorway Openings:

a) When steel strap is used across door opening, make sure it is securely tensioned and anchored.

b) Use at least two steel straps (1 1/4" x .031" or equivalent) per layer, unless the rolls are less than 25" in width (height), then use one strap per layer.

c) If there is the possibility of damage to the rolls, cover anchors, seals, or strap ends with protective material.

D.2: Key Lock (Strap):

a) A two-roll or five roll (1 1/4" x .031") key lock with an adequate number of straps per layer shall constitute doorway protection. Use one strap per layer except when the doorway is a single layer. If doorway is a single layer and rolls are more than 36" wide, two key straps per application are required.

b) For use of approved non-metallic strap in approved key strap applications, follow the requirements listed in the previous paragraph a).

c) Any key lock application must encompass all doorway rolls.

D.3: Anchor Brace for Pulpboard (for standard draft gear cars):

a) When 1 1/4" x .031" steel strap is used to anchor rolls greater than 58" diameter at the doorposts in a "U" arrangement, use nine straps to secure the load.
D.4: Alternatives to Steel Strap

a) Non-Metallic Strap

i) May be substituted for steel straps.

ii) Rate of substitution is outlined in current AAR General Information Series "Non-metallic Strap Substitution for Steel Strap as Doorway Protection in Boxcars".

b) Rubber Mats

i) The use of rubber mats is approved but not included in this publication. Refer to AAR General Information Series relating to this information.

Illustration No. 17
Non-Metallic Doorway Protection Application
E. EXCEPTIONS:

E.1 Roll Paper:

a) Rolls loaded in cushion equipped cars having plug doors DO NOT require doorway protection if all the following conditions are met:

i) Have a nominal diameter of 45" or less.

ii) Car is equipped with a minimum 15" end of car cushioning device or a sliding sill device.

iii) Rolls are loaded on end in the car. At origin, rolls are to be loaded tightly lengthwise of the car with lengthwise voids filled by dunnage materials or bracing.

iv) Loading pattern is secured using an AAR approved method.

E.2 Pulpboard Rolls only:

a) Rolls of 58" diameter pulpboard loaded in plug door boxcars DO NOT require doorway protection if all the following conditions are met:

i) Diameter of rolls does not exceed 58".

ii) Car is equipped with a minimum of a 15" end-of-car cushioning device or a sliding sill cushion device.

iii) Floor layer rolls are loaded on end in a 1-1 offset pattern in the car and secured in accordance with AAR approved loading methods.
SECTION NO. 6
BEST PRACTICES LOAD PLANS

Pages 2-4 of Section No. 6 include general information regarding the loading patterns found in this section. The remainder of this section covers loading patterns for 40", 42", 45", 50", 58", 60", and 72" diameter roll paper in 50’ box cars and loading patterns for 40", 42", 45", 48", 50", 58", 60", 65", 72", and 84" diameter roll paper in 60’ box cars.
SYMBOL EXPLANATIONS

The shaded areas indicate key banded rolls. Different fill patterns are used to indicate which rolls are secured together.

Examples of a two roll, figure eight key band unit and a five roll key band unit.

Examples of vertical dunnage bags used with contour buffer pads and corrugated or honeycomb filler pads.

Examples of horizontal dunnage bags used with and without corrugated or honeycomb filler pads.

Example of end wall filler pad.

Example of side wall filler or wall spacer.

Example of corrugated or honeycomb filler pads used between rolls.

Example of lumber in linerboard shipments to fill lengthwise voids.
BEST PRACTICE LOAD PLANS

The plans included in this section were developed through the experience and knowledge of the Quality Lead Team members.

They are provided to help you gain an understanding of how the paper and rail industries commonly load rolled paper.

The following questions were submitted to the team prior to this publication. We provide these answers to facilitate a better understanding of the Best Practice Booklet.

**Question:** Why would you use “Keys” in 40” diameter loads?

**Answer:** Key banding is an acceptable method for the securement of 40” diameter rolls and is included in the booklet to offer shippers all suitable loading alternatives.

**Question:** Why do patterns start with two rolls on the end and never one?

**Answer:** The booklet contains only the best loading practice. It is common knowledge that the single roll in many diameters allow for roll movement and/or this single roll crushing. Therefore the best practice is to use two rolls rather than the single point roll.

**Question:** Why is the width of the buffer 18” and not 22” or at least half of the width of the dunnage bag?

**Answer:** The booklet contains manufacturer’s and/or Association of American Railroad’s recommendations for the use of securement devices.
HOW TO APPLY A FOUR ROLL ‘X’ AND FIGURE-8’ PATTERN WITH NON-METALLIC STRAP

It is recommended that the following two methods (Illustration Nos. 19 and 20) be utilized when securing roll printing paper with 40”–42” diameter.
## 40" Diameter

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Three 30" wide disposable dunnage bags.

Use approved air bags for the following load weights:
- 75,001 lbs. to 160,000 lbs. use minimum Level #3 air bags;
- 160,001 lbs. to 205,000 lbs. use minimum Level #4 air bags.

Six 18" wide corrugated contour buffer pads approximately the height of the lading.
**KEYS TO SUCCESS**

Align dunnage bag centers and adjacent roll centers.

Inflate dunnage bags to 8 PSI. Keep dunnage bag voids between 4” to 12”.

Secure dunnage bags a minimum of 1” from the floor.

Ensure that dunnage bags do not exceed the height of the lading or contour buffers and that the bags are are close to the height of the load.

**WHAT IF LOADING ALTERNATIVES**

Voids exceeding 12 inches require additional AAR approved 3” thick corrugated or honeycomb filler pads, with a maximum of three fillers on each side of the dunnage bag. Place additional filler pads between rolls.

Voids less than 4 inches require a 41 roll pattern as indicated to the right or fill doorway voids with contour buffers and fillers as indicated below and to the right.

**BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)**

AAR approved doorway protection materials if indicated in the doorway protection data item above.

Three 30” wide disposable dunnage bags.

Use approved air bags for the following load weights:
- 75,001 lbs. to 160,000 lbs. use minimum Level #3 air bags;
- 160,001 lbs. to 205,000 lbs. use minimum Level #4 air bags.

Six 18” wide corrugated contour buffer pads approximately the height of the lading.
Three 30” wide disposable dunnage bags.

Use approved air bags for the following load weights:
- 75,001 lbs. to 160,000 lbs. use minimum Level #3 air bags;
- 160,001 lbs. to 205,000 lbs. use minimum Level #4 air bags.

Six 18” wide corrugated contour buffer pads approximately the height of the lading.
Three 30" wide disposable dunnage bags.

Use approved air bags for the following load weights:
- 75,001 lbs. to 160,000 lbs. use minimum Level #3 air bags;
- 160,001 lbs. to 205,000 lbs. use minimum Level #4 air bags.

Six 18" wide corrugated contour buffer pads approximately the height of the lading.
**KEYS TO SUCCESS**

Align dunnage bag centers and adjacent roll centers.

Inflate dunnage bags to 8 PSI. Keep dunnage bag voids between 4” to 12”.

Secure dunnage bags a minimum of 1” from the floor.

Ensure that dunnage bags do not exceed the height of the lading or contour buffers and that the bags are close to the height of load.

End wall rolls loaded along center line must touch and be centered along car center line.

**WHAT IF  LOADING ALTERNATIVES**

Voids exceeding 12 inches require additional AAR approved 3” thick corrugated or honeycomb filler pads, with a maximum of three fillers on each side of the dunnage bag. Place additional filler pads between rolls.

Voids less than 4 inches require a 41 roll pattern as indicated to the right or fill doorway voids with contour buffers and fillers as indicated below and to the right.

**BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)**

AAR approved doorway protection materials if indicated in the doorway protection data item above.

Three 30” wide disposable dunnage bags.

Use approved air bags for the following load weights:
- 75,001 lbs. to 160,000 lbs. use minimum Level #3 air bags;
- 160,001 lbs. to 205,000 lbs. use minimum Level #4 air bags.

Six 18” wide corrugated contour buffer pads approximately the height of the lading.
### Keys to Success

- Align dunnage bag centers and adjacent roll centers.
- Inflate dunnage bags to 8 PSI. Keep dunnage bag voids between 4" to 12".
- Secure dunnage bags a minimum of 1" from the floor.
- Ensure that dunnage bags do not exceed the height of the lading or contour buffers and that the bags are are close to the height of the load.
- End wall rolls loaded along center line must touch and be centered along car center line.

### What If Loading Alternatives

- Voids exceeding 12 inches require additional AAR approved 3" thick corrugated or honeycomb filler pads, with a maximum of three fillers on each side of the dunnage bag. Place additional filler pads between rolls.
- Voids less than 4 inches require a 41 roll pattern as indicated to the right or fill doorway voids with contour buffers and fillers as indicated below and to the right.

### Blocking and Bracing Materials Required (See Section 4 For Installation Data)

AAR approved doorway protection materials if indicated in the doorway protection data item above.

Three 30" wide disposable dunnage bags.

Use approved air bags for the following load weights:
- 75,001 lbs. to 160,000 lbs. use minimum Level #3 air bags;
- 160,001 lbs. to 205,000 lbs. use minimum Level #4 air bags.

Six 18" wide corrugated contour buffer pads approximately the height of the lading.
Align dunnage bag centers and adjacent roll centers.

Inflate dunnage bags to 8 PSI. Keep dunnage bag voids between 4” to 12”.

Secure dunnage bags a minimum of 1” from the floor.

Ensure that dunnage bags do not exceed the height of the lading or contour buffers and that the bags are are close to the height of the load.

Voids exceeding 12 inches require additional AAR approved 3” thick corrugated or honeycomb filler pads, with a maximum of three fillers on each side of the dunnage bag. Place additional filler pads between rolls.

Voids less than 4 inches require a 42 roll pattern as indicated to the right or fill doorway voids with contour buffers and fillers as indicated below and to the right.

AAR approved doorway protection materials if indicated in the doorway protection data item above.

Three 30” wide disposable dunnage bags.

Use approved air bags for the following load weights:
- 75,001 lbs. to 160,000 lbs. use minimum Level #3 air bags;
- 160,001 lbs. to 205,000 lbs. use minimum Level #4 air bags.

Six 18” wide corrugated contour buffer pads approximately the height of the lading.
KEYS TO SUCCESS

Align dunnage bag centers and adjacent roll centers.

Inflate dunnage bags to 8 PSI. Keep dunnage bag voids between 4" to 12".

Secure dunnage bags a minimum of 1" from the floor.

Ensure that dunnage bags do not exceed the height of the lading or contour buffers and that the bags are are close to the height of the load.

WHAT IF LOADING ALTERNATIVES

Voids exceeding 12 inches require additional AAR approved 3" thick corrugated or honeycomb filler pads, with a maximum of three fillers on each side of the dunnage bag. Place additional filler pads between rolls.

Voids less than 4 inches require a 41 roll pattern as indicated to the right or fill doorway voids with contour buffers and fillers as indicated below and to the right.

BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)

AAR approved doorway protection materials if indicated in the doorway protection data item above.

Three 30” wide disposable dunnage bags.

Use approved air bags for the following load weights:

- 75,001 lbs. to 160,000 lbs. use minimum Level #3 air bags;
- 160,001 lbs. to 205,000 lbs. use minimum Level #4 air bags.

Six 18” wide corrugated contour buffer pads approximately the height of the lading.

Three 18” wide corrugated filler pads approximately the height of the lading.
Three 30” wide disposable dunnage bags.

Use approved air bags for the following load weights:
- 75,001 lbs. to 160,000 lbs. use minimum Level #3 air bags;
- 160,001 lbs. to 205,000 lbs. use minimum Level #4 air bags.

Six 18” wide corrugated contour buffer pads approximately the height of the lading.
Six 18” wide corrugated filler pads approximately the height of the lading.
Three 30” wide disposable dunnage bags.
Use approved air bags for the following load weights:
- 75,001 lbs. to 160,000 lbs. use minimum Level #3 air bags;
- 160,001 lbs. to 205,000 lbs. use minimum Level #4 air bags.

Six 18” wide corrugated contour buffer pads approximately the height of the lading.
AAR approved non-metallic banding.
Tape or other suitable securement device to secure bands in position.
Three 30" wide disposable dunnage bags.

Use approved air bags for the following load weights:
- 75,001 lbs. to 160,000 lbs. use minimum Level #3 air bags;
- 160,001 lbs. to 205,000 lbs. use minimum Level #4 air bags.

Six 18" wide corrugated contour buffer pads approximately the height of the lading.

AAR approved non-metallic banding.

Tape or other suitable securement device to secure bands in position.
Three 30" wide disposable dunnage bags.
Use approved air bags for the following load weights:
75,001 lbs. to 160,000 lbs. use minimum Level #3 air bags; 160,001 lbs. to 205,000 lbs. use minimum Level #4 air bags.
Six 18" wide corrugated contour buffer pads approximately the height of the lading.
AAR approved non-metallic banding.
Tape or other suitable securement device to secure bands in position.
Ten use Level #5 air bags only.

---

**KEYS TO SUCCESS**

Inflate dunnage bags to 8 PSI. Keep dunnage bag voids between 4" to 12".

Secure dunnage bags a minimum of 1" from the floor.

Ensure that dunnage bags do not exceed height of lading.

Secure the non-metallic banding in position to protect against falling.

Doorway and end wall rolls loaded along center line must touch car center line.

---

**"WHAT IF" LOADING ALTERNATIVES**

Voids exceeding 12" require additional AAR approved 3" thick corrugated or honeycomb filler pads, with a maximum of three fillers on each side of the dunnage bag. Place additional filler pads between rolls.

Voids less than 4" require less filler pads as indicated.

---

**BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)**

Use Level #5 air bags only.

Ten 18" wide corrugated contour buffer pads approximately the height of the lading.

AAR approved non-metallic banding.

Tape or other suitable securement device to secure bands in position.
Three 30” wide disposable dunnage bags.
Use approved air bags for the following load weights:
- 75,001 lbs. to 160,000 lbs. use minimum Level #3 air bags;
- 160,001 lbs. to 205,000 lbs. use minimum Level #4 air bags.
Six 18” wide corrugated contour buffer pads approximately the height of the lading.
AAR approved non-metallic banding.
Tape or other suitable securement device to secure bands in position.
Tape or other suitable securement device to secure bands in position.

Three 30” wide disposable dunnage bags.

Use approved air bags for the following load weights:
- 75,001 lbs. to 160,000 lbs. use minimum Level #3 air bags;
- 160,001 lbs. to 205,000 lbs. use minimum Level #4 air bags.

Six 18” wide corrugated contour buffer pads approximately the height of the lading.

AAR approved non-metallic banding.

Tape or other suitable securement device to secure bands in position.

KEYS TO SUCCESS

Align dunnage bag centers and adjacent roll centers. Inflate dunnage bags to 8 PSI.

Keep dunnage bag voids between 4” to 12”. Secure dunnage bags a minimum of 1” from the floor.

Ensure that dunnage bags do not exceed height of lading or contour buffers and that the bags are as close to the height of the load.

Secure the non-metallic banding in position to protect against falling.

NOTE: Key bands in this method can also be considered doorway protection if they encompass all the doorway rolls.

“WHAT IF” LOADING ALTERNATIVES

Voids exceeding 12” require additional AAR approved 3” thick corrugated or honeycomb filler pads, with a maximum of three fillers on each side of the dunnage bag. Place additional filler pads between rolls.

Voids less than 4” require a 43 or 42 roll pattern.

BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)

Three 30” wide disposable dunnage bags.

Use approved air bags for the following load weights:
- 75,001 lbs. to 160,000 lbs. use minimum Level #3 air bags;
- 160,001 lbs. to 205,000 lbs. use minimum Level #4 air bags.

Six 18” wide corrugated contour buffer pads approximately the height of the lading.

AAR approved non-metallic banding.

Tape or other suitable securement device to secure bands in position.
Section 6-40 Dia. Page 16

Loading Roll Paper in Rail Cars

Table:

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<td>42 ROLL</td>
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Tape or other suitable securement device to secure bands in position.

Three 30" wide disposable dunnage bags.

Use approved air bags for the following load weights:
- 75,001 lbs. to 160,000 lbs. use minimum Level #3 air bags;
- 160,001 lbs. to 205,000 lbs. use minimum Level #4 air bags.

Six 18" wide corrugated contour buffer pads approximately the height of the lading.

AAR approved non-metallic banding.

NOTE: Key bands in this method can also be considered doorway protection if they encompass all the doorway rolls.

“WHAT IF” LOADING ALTERNATIVES

Voids exceeding 12” require additional AAR approved 3” thick corrugated or honeycomb filler pads, with a maximum of three fillers on each side of the dunnage bag. Place additional filler pads between rolls.

Blocking and Bracing Materials Required (See Section 4 for Installation Data)

Three 30” wide disposable dunnage bags.

Use approved air bags for the following load weights:
- 75,001 lbs. to 160,000 lbs. use minimum Level #3 air bags;
- 160,001 lbs. to 205,000 lbs. use minimum Level #4 air bags.

Six 18” wide corrugated contour buffer pads approximately the height of the lading.

AAR approved non-metallic banding.

NOTE: Key bands in this method can also be considered doorway protection if they encompass all the doorway rolls.

4/15/11
Inflate dunnage bags to 8 PSI. Keep dunnage bag voids between 4” to 12”.

Secure dunnage bags a minimum of 1” from the floor.

Ensure that dunnage bags do not exceed height of lading.

Secure the non-metallic banding in position to protect against falling.

Doorway and end wall rolls loaded along center line must touch car center line.

Voids exceeding 12” require additional AAR approved 3” thick corrugated or honeycomb filler pads, with a maximum of three fillers on each side of the dunnage bag. Place additional filler pads between rolls.

Voids less than 4” require less filler pads as indicated.

Use Level #5 air bags only.

Eight 18” wide corrugated contour buffer pads approximately the height of the lading

AAR approved non-metallic banding.

Tape or other suitable securement device to secure bands in position.
Tape or other suitable securement device to secure bands in position.

Three 30” wide disposable dunnage bags.

Use approved air bags for the following load weights:
- 75,001 lbs. to 160,000 lbs. use minimum Level #3 air bags;
- 160,001 lbs. to 205,000 lbs. use minimum Level #4 air bags.

Six 18” wide corrugated contour buffer pads approximately the height of the lading.

One 18” wide AAR approved filler pad approximately the height of the lading.

AAR approved non-metallic banding.

Tape or other suitable securement device to secure bands in position.
Tape or other suitable securement device to secure bands in position.

Three 30” wide disposable dunnage bags.

Use approved air bags for the following load weights:
- 75,001 lbs. to 160,000 lbs. use minimum Level #3 air bags;
- 160,001 lbs. to 205,000 lbs. use minimum Level #4 air bags.

Six 18” wide corrugated contour buffer pads approximately the height of the lading.

One 18” wide AAR approved filler pad approximately the height of the lading.

AAR approved non-metallic banding.

Tape or other suitable securement device to secure bands in position.

KEYS TO SUCCESS

Align dunnage bag centers and adjacent roll centers. Inflate dunnage bags to 8 PSI.

Keep dunnage bag voids between 4” to 12”. Secure dunnage bags a minimum of 1” from the floor.

Ensure that dunnage bags do not exceed height of lading or contour buffers and that the bags are as close to the height of the load.

Secure the non-metallic banding in position to protect against falling.

End wall rolls loaded along center line must touch along the car center line.

NOTE: Key bands in this method can also be considered doorway protection if they encompass all the doorway rolls.

“WHAT IF” LOADING ALTERNATIVES

Voids exceeding 12” require additional AAR approved 3” thick corrugated or honeycomb filler pads, with a maximum of three fillers on each side of the dunnage bag. Place additional filler pads between rolls.

Voids less than 4” require a 42 roll pattern.

BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)

Three 30” wide disposable dunnage bags.

Use approved air bags for the following load weights:
- 75,001 lbs. to 160,000 lbs. use minimum Level #3 air bags;
- 160,001 lbs. to 205,000 lbs. use minimum Level #4 air bags.

Six 18” wide corrugated contour buffer pads approximately the height of the lading.

One 18” wide AAR approved filler pad approximately the height of the lading.

AAR approved non-metallic banding.

Tape or other suitable securement device to secure bands in position.
Three 30 " wide disposable dunnage bags.
Use approved air bags for the following load weights:
75,001 lbs. to 160,000 lbs. use minimum Level #3 air bags; 160,001 lbs. to 205,000 lbs. use minimum Level #4 air bags.
Six 18" wide corrugated contour buffer pads and three 18" wide AAR approved filler pads, approximately the height of the lading.
AAR approved non-metallic banding.
Tape or other suitable securement device to secure bands in position.
Ten 18” wide corrugated contour buffer pads approximately the height of the lading.
Use Level #5 air bags only.

**KEYS TO SUCCESS**

- Inflate dunnage bags to 8 PSI. Keep dunnage bag voids between 4” to 12”.
- Secure dunnage bags a minimum of 1” from the floor.
- Ensure that dunnage bags do not exceed height of lading.
- Secure the non-metallic banding in position to protect against falling.
- Doorway and end wall rolls loaded along center line must touch car center line.

**“WHAT IF” LOADING ALTERNATIVES**

- Voids exceeding 12” require additional AAR approved 3” thick corrugated or honeycomb filler pads, with a maximum of three fillers on each side of the dunnage bag. Place additional filler pads between rolls.
- Voids less than 4” require less filler pads as indicated.

**BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)**

- Use Level #5 air bags only.
- Ten 18” wide corrugated contour buffer pads approximately the height of the lading.
- AAR approved non-metallic banding.
- Tape or other suitable securement device to secure bands in position.
**Keys to Success**

Ensure that the two rolls encircled by each unit band do not touch.

Secure the unit bands in position.

Place wooden or other suitable spacers between the bands and rolls, near the six roll apexes.

Ensure that all rolls loaded ahead of the doorposts are unitized.

**NOTE:** Key bands in this method can also be considered doorway protection if they encompass all the doorway rolls.

**“What If” Loading Alternatives**

Rolls extending into the door sill area or not fitting in plug door rail cars require a 43 or 42 roll pattern.

**Blocking and Bracing Materials Required (See Section 4 for Installation Data)**

- AAR approved 1 ¼ " x .031 steel banding and seals for unit bands.
- Six suitable spacers, one near each roll apex within the unit bands.
- Kraft paper or other suitable material to cover inside of bands and seals.
- Staples or nails to secure bands to the spacers.
KEYS TO SUCCESS

Ensure that the two rolls encircled by each unit band do not touch.

Secure the unit bands in position.

Place wooden or other suitable spacers between the bands and rolls, near the six roll apexes.

Ensure that all rolls loaded ahead of the doorposts are unitized.

End wall rolls loaded along center line must touch and be centered along car center line.

NOTE: Key bands in this method can also be considered doorway protection if they encompass all the doorway rolls.

"WHAT IF" LOADING ALTERNATIVES

Rolls extending into the door sill area or not fitting in plug door rail cars require a 42 or 40 roll pattern.

BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)

AAR approved 1 ¼” x .031 steel banding and seals for unit bands.

Six suitable spacers, one near each roll apex within the unit bands.

Kraft paper or other suitable material to cover inside of bands and seals.

Staples or nails to secure bands to the spacers.
Keys to success:

Ensure that the two rolls encircled by each unit band do not touch.

Secure the unit bands in position.

Place wooden or other suitable spacers between the bands and rolls, near the six roll apexes.

Ensure that all rolls loaded ahead of the doorposts are unitized.

End wall rolls loaded along center line must touch and be centered along car center line.

Note: Key bands in this method can also be considered doorway protection if they encompass all the doorway rolls.

“What if” loading alternatives:

Rolls extending into the door sill area or not fitting in plug door rail cars require a 48 roll pattern.

Blocking and bracing materials required (see Section 4 for Installation Data)

AAR approved 1 ¼ “ x .031 steel banding and seals for unit bands.

Six suitable spacers, one near each roll apex within the unit bands.

Kraft paper or other suitable material to cover inside of bands and seals.

Staples or nails to secure bands to the spacers.
Loading Roll Paper in Rail Cars

40" DIAMETER 50-6 x 9-4 RAILCAR STEEL BAND APPLICATION 44 ROLL PATTERN

COMMODITIES: NEWS PRINT X PRINTING PAPER X PULP BOARD X LINER BOARD X MEDIUM X PULP X

DOOR TYPE: SINGLE SLIDING X DOUBLE SLIDING SINGLE PLUG X DOUBLE PLUG COMBO

DOORWAY PROTECTION: YES NO

DOOR WIDTH: 8 FOOT X 10 FOOT X 12 FOOT X 16 FOOT

DRAFT GEAR TYPE STANDARD END OF CAR X CUSHION UNDERFRAME X X MEANS YES

KEYS TO SUCCESS

Ensure that the two rolls encircled by each unit band do not touch.

Secure the unit bands in position.

Place wooden or other suitable spacers between the bands and rolls, near the six roll apexes.

Ensure that all rolls loaded ahead of the doorposts are unitized.

NOTE: Key bands in this method can also be considered doorway protection if they encompass all the doorway rolls.

“WHAT IF” LOADING ALTERNATIVES

Rolls extending into the door sill area or not fitting in plug door rail cars require a 43 or 42 roll pattern.

BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)

AAR approved 1 ¼" x .031 steel banding and seals for unit bands.
Six suitable spacers, one near each roll apex within the unit bands.
Kraft paper or other suitable material to cover inside of bands and seals.
Staples or nails to secure bands to the spacers.
KEYS TO SUCCESS

Ensure that the two rolls encircled by each unit band do not touch.

Secure the unit bands in position.

Place wooden or other suitable spacers between the bands and rolls near the six roll apexes.

Ensure that all rolls loaded ahead of the doorposts are unitized.

End wall rolls loaded along center line must touch and be centered along car center line.

NOTE: Key bands in this method can also be considered doorway protection if they encompass all the doorway rolls.

"WHAT IF" LOADING ALTERNATIVES

Rolls extending into the door sill area or not fitting in plug door rail cars require a 43 or 42 roll pattern.

Note corrugated filler pad in one end of the car.

BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)

AAR approved 1 1/8 " x .031 steel banding and seals for unit bands.

Six suitable spacers, one near each roll apex within the unit bands.

Kraft paper or other suitable material to cover inside of bands and seals.

Staples or nails to secure bands to the spacers.
Loading Roll Paper in Rail Cars

40" DIAMETER  50-6 x 9-4 RAILCAR  STEEL BAND APPLICATION  42 ROLL PATTERN

COMMODITIES:
NEWS PRINT  X  PRINTING PAPER  X  PULP BOARD  X  LINER BOARD  X  MEDIUM  X  PULP  X

DOOR TYPE:
SINGLE SLIDING  X  DOUBLE SLIDING  X  SINGLE PLUG  X  DOUBLE PLUG  X  COMBO  

DOORWAY PROTECTION:
YES  X  NO  

DOOR WIDTH:
8 FOOT  X  10 FOOT  X  12 FOOT  X  16 FOOT  

DRAFT GEAR TYPE:
STANDARD  X  END OF CAR  X  CUSHION UNDERFRAME  X  

KEYS TO SUCCESS

Ensure that the two rolls encircled by each unit band do not touch.

Secure the unit bands in position.

Place wooden or other suitable spacers between the bands and rolls, near the six roll apexes.

Ensure that all rolls loaded ahead of the doorposts are unitized.

End wall rolls loaded along center line must touch and be centered along car center line.

NOTE: Key bands in this method can also be considered doorway protection if they encompass all the doorway rolls.

"WHAT IF" LOADING ALTERNATIVES

Rolls extending into the door sill area or not fitting in plug door rail cars require a 40 roll pattern.

BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)

AAR approved 1 ¼ " x .031 steel banding and seals for unit bands.
Six suitable spacers, one near each roll apex within the unit bands.
Kraft paper or other suitable material to cover inside of bands and seals.
Staples or nails to secure bands to the spacers.
LOADING ROLL PAPER IN RAIL CARS

40" DIAMETER

50-6 x 9-6 RAILCAR

STEEL BAND APPLICATION

44 ROLL PATTERN

COMMODITIES:

NEWS PRINT X PRINTING PAPER X PULP BOARD X LINER BOARD MEDIUM X PULP X

DOOR TYPE:

SINGLE SLIDING X DOUBLE SLIDING SINGLE PLUG X DOUBLE PLUG COMBO

DOORWAY PROTECTION:

YES X SLIDING NO X PLUG X COMBO

DOOR WIDTH:

8 FOOT X 10 FOOT X 12 FOOT X 16 FOOT

DRAFT GEAR TYPE

STANDARD

END OF CAR X CUSHION UNDERFRAME X X MEANS YES

KEYS TO SUCCESS

Ensure that the two rolls encircled by each unit band do not touch.

Secure the unit bands in position.

Place wooden or other suitable spacers between the bands and rolls, near the six roll apexes.

Ensure that all rolls loaded ahead of the doorposts are unitized.

NOTE: Key bands in this method can also be considered doorway protection if they encompass all the doorway rolls.

“What If” Loading Alternatives

Rolls extending into the door sill area or not fitting in plug door rail cars require a 43 or 42 roll pattern.

Blocking and Bracing Materials Required (See Section 4 for Installation Data)

AAR approved 1 ½ ” x .031 steel banding and seals for unit bands.

Six suitable spacers, one near each roll apex within the unit bands.

Kraft paper or other suitable material to cover inside of bands and seals.

Staples or nails to secure bands to the spacers.

4/15/11
Loading Roll Paper in Rail Cars

<table>
<thead>
<tr>
<th>40” DIAMETER</th>
<th>50-6 x 9-6 RAILCAR</th>
<th>STEEL BAND APPLICATION</th>
<th>43 ROLL PATTERN</th>
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<th>12 FOOT</th>
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<th>STANDARD</th>
<th>END OF CAR</th>
<th>CUSHION UNDERFRAME</th>
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**KEYS TO SUCCESS**

Ensure that the two rolls encircled by each unit band do not touch.

Secure the unit bands in position.

Place wooden or other suitable spacers between the bands and rolls, near the six roll apexes.

Ensure that all rolls loaded ahead of the doorposts are unitized.

End wall rolls loaded along center line must touch and be centered along car center line.

NOTE: Key bands in this method can also be considered doorway protection if they encompass all the doorway rolls.

**“WHAT IF” LOADING ALTERNATIVES**

Rolls extending into the door sill area or not fitting in plug door rail cars require a 42 or less roll pattern.

**BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)**

AAR approved 1 ¼” x .031 steel banding and seals for unit bands.

Six suitable spacers, one near each roll apex within the unit bands.

Kraft paper or other suitable material to cover inside of bands and seals.

Staples or nails to secure bands to the spacers.
KEYS TO SUCCESS

Ensure that the two rolls encircled by each unit band do not touch.

Secure the unit bands in position.

Place wooden or other suitable spacers between the bands and rolls, near the six roll apexes.

Ensure that all rolls loaded ahead of the doorposts are unitized.

End wall rolls loaded along center line must touch and be centered along car center line.

NOTE: Key bands in this method can also be considered doorway protection if they encompass all the doorway rolls.

“WHAT IF” LOADING ALTERNATIVES

Rolls extending into the door sill area or not fitting in plug door rail cars require a 41 roll pattern. Note corrugated or honeycomb filler pad in one end of the car.

Blocking and Bracing Materials Required (See Section 4 for Installation Data)

AAR approved 1 ¼” x .031 steel banding and seals for unit bands.

Six suitable spacers, one near each roll apex within the unit bands.

Kraft paper or other suitable material to cover inside of bands and seals.

Staples or nails to secure bands to the spacers.
## 42" Diameter

<table>
<thead>
<tr>
<th>Page</th>
<th>Car Size</th>
<th>Load Patterns</th>
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<tbody>
<tr>
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<td>Non-Metallic Banding &amp; Horizontal Dunnage Bags</td>
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<td>Steel Banding</td>
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<td>50'6&quot; x 9'6&quot;</td>
<td>38 Roll</td>
<td>Horizontal Dunnage Bags</td>
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<tr>
<td>4</td>
<td>50'6&quot; x 9'6&quot;</td>
<td>39 Roll</td>
<td>Horizontal Dunnage Bags</td>
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</table>
Inflated dunnage bag to 8 PSI. Keep dunnage bag voids between 4” to 12”.

Use one dunnage bag per layer and secure dunnage bags to a minimum of 1” from the floor.

Ensure that dunnage bags do not exceed height of lading.

Secure non-metallic banding in position to prevent against falling.

**“WHAT IF” LOADING ALTERNATIVES**

**BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)**

AAR approved doorway protection materials if indicated in the doorway protection data item above.

Use Level #5 air bags only.

AAR approved non-metallic banding for unitizing rolls.

Tape or other suitable securement device to secure bands in position.
Secure steel band(s) in position to protect against falling during transit.

NOTE: Key bands in this method can also be considered doorway protection if they encompass all the doorway rolls.

“WHAT IF” LOADING ALTERNATIVES

BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)

AAR approved 1 1/4” x .031” steel banding and seals for key bands.

Tape or other suitable securement device to secure bands in position.
Inflate dunnage bag to 8 PSI. Keep dunnage bag voids between 4” to 12”.

Use one dunnage bag per layer and secure dunnage bag to a minimum of 1” from the floor.

Ensure that dunnage bag does not exceed height of lading.

Use Level #5 air bags only.

BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)

Use Level #5 air bags only.
Align dunnage bag centers and adjacent roll centers.

Inflate dunnage bags to 8 PSI. Keep dunnage bag voids between 4" to 12".

Secure dunnage bags to a minimum of 1" from the floor.

Ensure that dunnage bags do not exceed height of lading or contour buffers and that the bags are as close to the height of the load.

End wall rolls loaded along center line must touch and be centered along car center line.

**“WHAT IF” LOADING ALTERNATIVES**

**BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)**

AAR approved doorway protection materials if indicated in the doorway protection data item above.

Three 30” side disposable dunnage bags.

Use approved air bags for the following load weights:
75,001 lbs. to 160,000 lbs. use minimum Level #3 air bags; 160,001 lbs. to 205,000 lbs. use minimum Level #4 air bags.

Six 18” wide corrugated contour buffer pads approximately the height of the lading.

Use 18” wide corrugated filler pads, as needed, approximately the height of the lading.
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### 45" Diameter

<table>
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<td>Horizontal Dunnage Bags</td>
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<td>28 Roll</td>
<td>Non-Metallic Banding &amp; Horizontal Dunnage Bags</td>
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COMMODITIES: NEWS PRINT X PRINTING PAPER X PULP BOARD LINER BOARD MEDIUM PULP X

DOOR TYPE: SINGLE SLIDING X DOUBLE SLIDING SINGLE PLUG X DOUBLE PLUG COMBO

DOORWAY PROTECTION: YES NO

DOOR WIDTH: 8 FOOT X 10 FOOT X 12 FOOT 16 FOOT

DRAFT GEAR TYPE STANDARD END OF CAR X CUSHION UNDERFRAME X X MEANS YES

KEYS TO SUCCESS

Inflate dunnage bags to 8 PSI. Keep dunnage bag void between 4” to 12”.

Secure dunnage bags a minimum of 1” from the floor.

Ensure that dunnage bags do not exceed the height of the lading.

Doorway rolls loaded along car center line must touch and be centered along car center line.

“WHAT IF” LOADING ALTERNATIVES

Voids exceeding 12 inches require additional AAR approved 3” thick corrugated or honeycomb filler pads, with a maximum of three fillers on each side of the dunnage bag. Place additional filler pads between rolls.

Voids less than 4” require placing a single center row roll with a two roll set loaded along car center in one of the box car as indicated.

Rolls loaded ahead of doorposts require AAR approved steel banding to unitize the rolls.

BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)

One 102” long AAR approved disposable dunnage bags.

Use Level # 5 air bags only.

Tape or other suitable securement device to secure bands in position.
Inflate dunnage bags to 8 PSI. Keep dunnage bag void between 4" to 12".

Secure dunnage bags a minimum of 1" from the floor.

Ensure that dunnage bags do not exceed the height of the lading.

Use non-metallic banding is secured in position to prevent against falling.

Doorway rolls loaded along car center line must touch and be centered along car center line.

"WHAT IF" LOADING ALTERNATIVES

Voids exceeding 12 inches require additional AAR approved 3" thick corrugated or honeycomb filler pads, with a maximum of three fillers on each side of the dunnage bag. Place additional filler pads between rolls.

Voids less than 4" require a 27 roll pattern.

BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)

One 102" long AAR approved disposable dunnage bags. Use Level #5 air bags only.

AAR approved non-metallic banding for unitizing rolls.

Tape or other suitable securement device to secure bands in position.
KEYS TO SUCCESS

Inflate dunnage bags to 8 PSI. Keep dunnage bag void between 4” to 12”.

Secure dunnage bags a minimum of 1” from the floor.

Ensure that dunnage bags do not exceed the height of the lading.

Use non-metallic banding is secured in position to prevent against falling.

Doorway rolls loaded along car center line must touch and be centered along car center line.

“WHAT IF” LOADING ALTERNATIVES

Voids exceeding 12 inches require additional AAR approved 3” thick corrugated or honeycomb filler pads, with a maximum of three fillers on each side of the dunnage bag. Place additional filler pads between rolls.

Voids less than 4” require a 28 roll pattern.

BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)

One 102” long AAR approved disposable dunnage bags. Use Level #5 air bags only.
AAR approved non-metallic banding for utilizing rolls.
Tape or other suitable securement device to secure bands in position.
# Loading Roll Paper in Rail Cars

## Keys to Success

Ensure that the two rolls encircled by each unit do not touch. (A five roll key unit is an approved alternative.)

Secure the unit bands in position.

Place wooden or other suitable spacers between the bands and rolls, near the four roll apexes.

Ensure that all rolls loaded ahead of the doorposts are unitized.

**NOTE:** Key bands in this method can also be considered doorway protection if they encompass all the doorway rolls.

## "What If" Loading Alternatives

Rolls extending into the door sill area or will not fit in plug door rail cars require a 26 roll pattern.

Unitize rolls contacting each other require side wall fillers to spread unitized rolls. Use as many AAR approved corrugated or honeycomb filler pads as necessary to prevent roll contact.

## Blocking and Bracing Materials Required (See Section 4 for Installation Data)

- AAR approved 1 3/4” x .031 steel banding and seals for unit bands.
- Four suitable spacers, one near each roll apex within the unit bands.
- Kraft paper or other suitable material to cover inside of bands and seals.
- Staples or nails to secure bands to the spacers.
Loading Roll Paper in Rail Cars

**45" DIAMETER**  
**50-6 x 9-2 RAILCAR**  
**STEEL BAND APPLICATION**  
**28 ROLL PATTERN**

**COMMODITIES:**  
NEWS PRINT X  
PRINTING PAPER X  
PULP BOARD X  
LINER BOARD X  
MEDIUM X  
PULP X

**DOOR TYPE:**  
SINGLE SLIDING X  
DOUBLE SLIDING  
SINGLE PLUG X  
DOUBLE PLUG  
COMBO

**DOORWAY PROTECTION:**  
YES  
NO

**DOOR WIDTH:**  
8 FOOT X  
10 FOOT X  
12 FOOT X  
16 FOOT

**DRAFT GEAR TYPE:**  
STANDARD  
END OF CAR X  
CUSHION UNDERFRAME X  
X MEANS YES

**KEYS TO SUCCESS**

Ensure that the two rolls encircled by each unit do not touch.

Secure the unit bands in position.

Place wooden or other suitable spacers between the bands and rolls, near the four roll apexes.

Ensure that all rolls loaded ahead of the doorposts are unitized.

**NOTE:** Key bands in this method can also be considered doorway protection if they encompass all the doorway rolls.

**“WHAT IF” LOADING ALTERNATIVES**

Rolls extending into the door sill area or will not fit in plug door rail cars require a 27 roll pattern.

Unitize rolls contacting each other require side wall fillers to spread unitized rolls. Use as many AAR approved corrugated or honeycomb filler pads as necessary to prevent roll contact.

Rolls loaded ahead of doorposts require appropriate AAR approved steel banding to unitize the rolls.

**BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)**

AAR approved 1 ¼ " x .031 steel banding and seals for unit bands.

Two suitable spacers, one near each roll apex within the unit bands.

Kraft paper or other suitable material to cover inside of bands and seals.

Staples or nails to secure bands to the spacers.
KEYS TO SUCCESS

Ensure that the left and right side rolls of each set encircled by each unit band do not touch. (Two roll units are approved alternative.)

Secure the unit bands in position.

Place wooden or other suitable spacers between the bands and rolls, near the four roll apexes.

Ensure that all rolls loaded ahead of the doorposts are unitized.

NOTE: Key bands in this method can also be considered doorway protection if they encompass all the doorway rolls.

"WHAT IF" LOADING ALTERNATIVES

Rolls extending into the door sill area or will not fit in plug door rail cars require a 28 roll pattern.

Utilize rolls contacting each other require side wall fillers to spread unitized rolls. Use as many AAR approved corrugated or honeycomb filler pads as necessary to prevent roll contact.

BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)

AAR approved 1 ¼” x .031 steel banding and seals for unit bands.

Four suitable spacers, one near each roll apex within the unit bands.

Kraft paper or other suitable material to cover inside of bands and seals.

Staples or nails to secure bands to the spacers.
Loading Roll Paper in Rail Cars

Section 6-45 Dia. Page 7

45" DIAMETER
50-6 x 9.6 RAILCAR
STEEL BAND APPLICATION
30 ROLL PATTERN

COMMODITIES:
NEWS PRINT X PRINTING PAPER X PULP BOARD X LINER BOARD X MEDIUM X PULP X

DOOR TYPE:
SINGLE SLIDING X DOUBLE SLIDING

DOORWAY PROTECTION:
YES SLIDING X SINGLE PLUG X DOUBLE PLUG COMBO

DOOR WIDTH:
8 FOOT X 10 FOOT X 12 FOOT 16 FOOT

DRAFT GEAR TYPE
STANDARD END OF CAR X CUSHION UNDERFRAME X X MEANS YES

KEYS TO SUCCESS

Ensure that the two rolls of each unit band do not touch.
Secure the unit bands in position.
Place wooden or other suitable spacers between the bands and rolls, near the four roll apexes.
Ensure that all rolls loaded ahead of the doorposts are unitized.

NOTE: Key bands in this method can also be considered doorway protection if they encompass all the doorway rolls.

“WHAT IF” LOADING ALTERNATIVES

Rolls extending into the door sill area or will not fit in plug door rail cars require a 29 roll pattern.

Unitize rolls contacting each other require side wall fillers to spread unitized rolls. Use as many AAR approved corrugated or honeycomb filler pads as necessary to prevent roll contact.

Rolls loading ahead of doorposts require appropriate AAR approved steel banding to unitize the rolls.

BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)

AAR approved 1 ¾ " x .031 steel banding and seals for unit bands.
Two suitable spacers, one near each roll apex within the unit bands.
Kraft paper or other suitable material to cover inside of bands and seals.
Staples or nails to secure bands to the spacers.
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# 50" Diameter

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</table>
This Page Left Blank Intentionally.
**One 102'' long disposable dunnage bag meeting AAR standards.**

**Use Level #5 air bags only.**

**Tape or other suitable securement device to secure bands in position.**

---

### KEYS TO SUCCESS

Inflate dunnage bags to 8 PSI. Keep dunnage bag void between 4” to 12”.

Secure dunnage bags a minimum of 1” from the floor.

Ensure that dunnage bags do not exceed the height of the lading.

Doorway rolls loaded along car center line must touch and be centered along car center line.

---

### "WHAT IF" LOADING ALTERNATIVES

Voids exceeding 12 inches require additional AAR approved 3” thick corrugated or honeycomb filler pads, with a maximum of three fillers on each side of the dunnage bag. Place additional filler pads between rolls.

Voids less than 4” require changing to a 2-1-2 pattern two positions from end wall in one end of the car as indicated.

Rolls loaded ahead of doorposts require AAR approved steel banding to unitize the rolls.

---

### BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)

AAR approved doorway protection materials if indicated in the doorway protection data item above.

One 102” long disposable dunnage bag meeting AAR standards.

Use Level #5 air bags only.

Tape or other suitable securement device to secure bands in position.
One 102'' long disposable dunnage bag meeting AAR standards.

Use Level #5 air bags only.

**KEYS TO SUCCESS**

- Inflate dunnage bags to 8 PSI. Keep dunnage bag void between 4'' to 12''.
- Secure dunnage bags a minimum of 1'' from the floor.
- Ensure that dunnage bags do not exceed the height of the lading.
- Doorway rolls loaded along car center line must touch and be centered along car center line.

**“WHAT IF” LOADING ALTERNATIVES**

- Voids exceeding 12 inches require additional AAR approved 3” thick corrugated or honeycomb filler pads, with a maximum of three fillers on each side of the dunnage bag. Place additional filler pads between rolls.
- Voids less than 4” require changing to a 2-2 pattern two positions from end wall in one end of the car as indicated.
- Rolls loaded ahead of doorposts require AAR approved steel banding to unitize the rolls.

**BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)**

AAR approved doorway protection materials if indicated in the doorway protection data item above.

- One 102” long disposable dunnage bag meeting AAR standards.
- Use Level #5 air bags only.
- Tape or other suitable securement device to secure bands in position.
Inflate dunnage bags to 8 PSI. Keep dunnage bag void between 4" to 12".

Secure dunnage bags a minimum of 1" from the floor.

Ensure that dunnage bags do not exceed the height of the lading.

Doorway rolls loaded along car center line must touch and be centered along car center line.

**WHAT IF** LOADING ALTERNATIVES

Voids exceeding 12 inches require additional AAR approved 3" thick corrugated or honeycomb filler pads, with a maximum of three fillers on each side of the dunnage bag. Place additional filler pads between rolls.

Voids less than 4" require changing to a 2:2 pattern two positions from end wall in one end of the car as indicated.

Rolls loaded ahead of doorposts require AAR approved steel banding to unitize the rolls.

**BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)**

AAR approved doorway protection materials if indicated in the doorway protection data item above.

One 102" long disposable dunnage bag meeting AAR standards.

Use Level #5 air bags only.

Tape or other suitable securement device to secure bands in position.
### KEYS TO SUCCESS

Ensure that the two rolls encircled by the unit band do not touch.

Secure the unit bands in position.

Ensure that all rolls loaded ahead of the doorposts are unitized.

**NOTE:** Key bands in this method can also be considered doorway protection if they encompass all the doorway rolls.

### “WHAT IF” LOADING ALTERNATIVES

- **Rolls extending into the door sill area or will not fit in plug door rail cars require a 23 roll pattern.**
- **Unitized rolls contacting each other require side wall filler to spread unitized rolls. Use as many AAR approved corrugated or honeycomb filler pads as necessary to prevent roll contact.**
- **Rolls loaded ahead of doorposts require AAR approved steel banding to unitize the rolls.**

### BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)

- AAR approved non-metallic banding
- Tape or other suitable securement device to secure bands in position.
**Loading Roll Paper in Rail Cars**

**COMMODITIES:**

- **NEWS PRINT** X
- **PRINTING PAPER** X
- **PULP BOARD**
- **LINER BOARD** MEDIUM
- **PULP** X

**DOOR TYPE:**

- **SINGLE SLIDING** X
- **DOUBLE SLIDING**
- **SINGLE PLUG** X
- **DOUBLE PLUG**
- **COMBO**

**DOORWAY PROTECTION:**

- **YES**
- **NO**

**DOOR WIDTH:**

- **8 FOOT** X
- **10 FOOT** X
- **12 FOOT** X
- **16 FOOT**

**DRAFT GEAR TYPE:**

- **STANDARD**
- **END OF CAR** X
- **CUSHION UNDERFRAME** X
- **MEANS YES**

**KEYS TO SUCCESS**

Ensure that the two rolls encircled by the unit band do not touch.

Secure the unit bands in position.

Ensure that all rolls loaded ahead of the doorposts are unitized.

**NOTE:** Key bands in this method can also be considered doorway protection if they encompass all the doorway rolls.

**“WHAT IF” LOADING ALTERNATIVES**

- Rolls extending into the door sill area or will not fit in plug door rail cars require a 22 roll pattern.

- Unitized rolls contacting each other require side wall filler to spread unitized rolls. Use as many AAR approved corrugated or honeycomb filler pads as necessary to prevent roll contact.

- Rolls loaded ahead of doorposts require AAR approved steel banding to unitize the rolls.

**BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)**

- AAR approved non-metallic banding
- Tape or other suitable securement device to secure bands in position.
- Two AAR approved corrugated side wall spacers.
KEYS TO SUCCESS

Ensure that the two rolls encircled by the unit band do not touch
Secure the unit bands in position.
Ensure that all rolls loaded ahead of the doorposts are unitized.
NOTE: Key bands in this method can also be considered doorway protection if they encompass all the doorway rolls.

“WHAT IF” LOADING ALTERNATIVES

Rolls extending into the door sill area or will not fit in plug door rail cars require a 22 roll pattern.

Unitized rolls contacting each other require side wall filler to spread unitized rolls. Use as many AAR approved corrugated or honeycomb filler pads as necessary to prevent roll contact

BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)

AAR approved non-metallic banding
Tape or other suitable securement device to secure bands in position.
KEYS TO SUCCESS

Ensure that the two rolls encircled by the unit band do not touch

Secure the unit bands in position.

Ensure that all rolls loaded ahead of the doorposts are unitized.

NOTE: Key bands in this method can also be considered doorway protection if they encompass all the doorway rolls.

“WHAT IF” LOADING ALTERNATIVES

Rolls extending into the door sill area or will not fit in plug door rail cars require a 2-2 roll pattern in both ends of the car.

Unitized rolls contacting each other require side wall filler to spread unitized rolls. Use as many AAR approved corrugated or honeycomb filler pads as necessary to prevent roll contact

Rolls loaded ahead of doorposts require AAR approved steel banding to unitize the rolls.

BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)

AAR approved non-metallic banding
Tape or other suitable materials to secure bands.
**Section 6-50 Dia. Page 8**

**Loading Roll Paper in Rail Cars**

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<tr>
<th><strong>50&quot; DIAMETER</strong></th>
<th><strong>50-6 x 9-2 RAILCAR</strong></th>
<th><strong>STEEL BAND APPLICATION</strong></th>
<th><strong>24 ROLL PATTERN</strong></th>
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<td><strong>DRAFT GEAR TYPE:</strong></td>
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**KEYS TO SUCCESS**

Ensure that the two rolls encircled by the unit band do not touch.

Secure the unit bands in position.

Place wooden or other suitable spacers between the bands and rolls, near the two roll apexes.

Ensure that all rolls loaded ahead of the doorposts are unitized.

**NOTE:** Key bands in this method can also be considered doorway protection if they encompass all the doorway rolls.

**“WHAT IF” LOADING ALTERNATIVES**

- Rolls extending into the door sill area or will not fit in plug door rail cars require a 23 roll pattern in both ends of the car.

- Unitized rolls contacting each other require side wall filler to spread unitized rolls. Use as many AAR approved corrugated or honeycomb filler pads as necessary to prevent roll contact.

- Rolls loaded ahead of doorposts require AAR approved steel banding to unitize the rolls.

**BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)**

- AAR approved 1 ¼ “ x .031 steel banding and seals for unit bands.
- Two suitable spacers, one near each roll apex within the unit bands.
- Kraft paper or other suitable material to cover inside of bands and seals.
- Staples or nails to secure bands to the spacers.
Loading Roll Paper in Rail Cars

**Section 6-50 Dia. Page 9**

**50" DIAMETER**

**50-6 x 9-2 RAILCAR**

**STEEL BAND APPLICATION**

**23 ROLL PATTERN**

---

**COMMODITIES:**

- NEWS PRINT
- PRINTING PAPER
- PULP BOARD
- LINER BOARD
- MEDIUM
- PULP

**DOOR TYPE:**

- SINGLE SLIDING
- DOUBLE SLIDING
- SINGLE PLUG
- DOUBLE PLUG
- COMBO

**DOORWAY PROTECTION:**

- YES
- NO

**DOOR WIDTH:**

- 8 FOOT
- 10 FOOT
- 12 FOOT
- 16 FOOT

**DRAFT GEAR TYPE**

- STANDARD
- END OF CAR
- CUSHION UNDERFRAME

**KEYS TO SUCCESS**

- Ensure that the two rolls encircled by the unit band do not touch
- Secure the unit bands in position.
- Place wooden or other suitable spacers between the bands and rolls, near the two roll apexes.
- Ensure that all rolls loaded ahead of the doorposts are utilized.
- NOTE: Key bands in this method can also be considered doorway protection if they encompass all the doorway rolls.

**"WHAT IF" LOADING ALTERNATIVES**

- Rolls extending into the door sill area or will not fit in plug door rail cars require a 22 roll pattern in both ends of the car.

- Unitized rolls contacting each other require side wall filler to spread unitized rolls. Use as many AAR approved corrugated or honeycomb filler pads as necessary to prevent roll contact.

- Rolls loaded ahead of doorposts require AAR approved steel banding to unitize the rolls.

**BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)**

- AAR approved 1 ¼ " x .031 steel banding and seals for unit bands.
- Two suitable spacers, one near each roll apex within the unit bands.
- Kraft paper or other suitable material to cover inside of bands and seals.
- Staples or nails to secure bands to the spacers
- Two AAR approved 3" thick by 36" long corrugated filler pads.
Loading Roll Paper in Rail Cars

**Section 6-50 Dia. Page 10**

**COMMODITIES:**
- NEWS PRINT X
- PRINTING PAPER X
- PULP BOARD X
- LINER BOARD X
- MEDIUM X
- PULP X

**DOOR TYPE:**
- SINGLE SLIDING X
- DOUBLE SLIDING X
- SINGLE PLUG X
- DOUBLE PLUG X
- COMBO X

**DOORWAY PROTECTION:**
- YES
- NO

**DOOR WIDTH:**
- 8 FOOT X
- 10 FOOT X
- 12 FOOT X
- 16 FOOT X

**DRAFT GEAR TYPE:**
- STANDARD
- END OF CAR X
- CUSHION UNDERFRAME X
- X MEANS YES

**KEYS TO SUCCESS**

Ensure that the two rolls encircled by the unit band do not touch.

Secure the unit bands in position.

Place wooden or other suitable spacers between the bands and rolls, near the two roll apexes.

Ensure that all rolls loaded ahead of the doorposts are unitized.

**NOTE:** Key bands in this method can also be considered doorway protection if they encompass all the doorway rolls.

**"WHAT IF" LOADING ALTERNATIVES**

- Rolls extending into the door sill area or will not fit in plug door rail cars require a 22 roll pattern in both ends of the car.

- Unitized rolls contacting each other require side wall filler to spread unitized rolls. Use as many AAR approved corrugated or honeycomb filler pads as necessary to prevent roll contact.

**BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)**

- AAR approved 1 ½ " x .031 steel banding and seals for unit bands.
- Two suitable spacers, one near each roll apex within the unit bands.
- Kraft paper or other suitable material to cover inside of bands and seals.
- Staples or nails to secure bands to the spacers.
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### KEYS TO SUCCESS

- Ensure that the two rolls encircled by the unit band do not touch
- Secure the unit bands in position.
- Place wooden or other suitable spacers between the bands and rolls, near the two roll apexes.
- Ensure that all rolls loaded ahead of the doorposts are unitized.
- **NOTE:** Key bands in this method can also be considered doorway protection if they encompass all the doorway rolls.

### "WHAT IF" LOADING ALTERNATIVES

- Rolls extending into the door sill area or will not fit in plug door rail cars require a 2-2 roll pattern in both ends of the car.

- Unitized rolls contacting each other require side wall filler to spread unitized rolls. Use as many AAR approved corrugated or honeycomb filler pads as necessary to prevent roll contact.

- Rolls loading ahead of doorposts require appropriate AAR approved steel banding to unitize the rolls.

### BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)

- **AAR approved 1 ¼" x .031 steel banding and seals for unit bands.**
- **Two suitable spacers, one near each roll apex within the unit bands.**
- **Kraft paper or other suitable material to cover inside of bands and seals.**
- **Staples or nails to secure bands to the spacers**
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## 58" Diameter

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**DUNNAGE BAG APPLICATION**

- Use two 36" wide disposable dunnage bags meeting AAR standards.
- 75,001 lbs. to 160,000 lbs. use minimum Level #3 air bags.
- 160,001 lbs. to 205,000 lbs. use minimum Level #4 air bags.

---

**KEYS TO SUCCESS**

- Align dunnage bag centers and adjacent roll centers.
- Inflate dunnage bags to 8 PSI. Keep dunnage bag void between 4" to 12".
- Secure dunnage bags a minimum of 1" from the floor.
- Ensure that dunnage bags do not exceed the height of the lading or contour buffers and that the bags are as close to the height of the load.

---

**“WHAT IF” LOADING ALTERNATIVES**

- Voids exceeding 12 inches require a twenty (20) roll pattern.
- Voids less than 4 inches require an eighteen (18) roll pattern.

---

**BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)**

- AAR approved doorway protection materials if indicated in the doorway protection data item above.
- Use two 36" wide disposable dunnage bags meeting AAR standards.
  - 75,001 lbs. to 160,000 lbs. use minimum Level #3 air bags.
  - 160,001 lbs. to 205,000 lbs. use minimum Level #4 air bags.
- Four 29" wide AAR approved corrugated contour buffer pads approximately the height of the lading
- Twelve 29" wide AAR approved corrugated filler pads.
Use two 36'' wide disposable dunnage bags meeting AAR standards.

75,001 lbs. to 160,000 lbs. use minimum Level #3 air bags.
160,001 lbs. to 205,000 lbs. use minimum Level #4 air bags

Align dunnage bag centers and adjacent roll centers.

Inflate dunnage bags to 8 PSI. Keep dunnage bag void between 4” to 12”.

Secure dunnage bags a minimum of 1” from the floor.

Ensure that dunnage bags do not exceed the height of the lading or contour buffers and that the bags are as close to the height of the load.

“WHAT IF” LOADING ALTERNATIVES

Voids exceeding 12 inches require additional AAR approved 3” thick corrugated or honeycomb filler pads, with a maximum of three fillers on each side of the dunnage bag. Place additional filler pads between rolls.

Voids less than 4 inches require a 19 roll pattern.

BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)

AAR approved doorway protection materials if indicated in the doorway protection data item above.

Use two 36” wide disposable dunnage bags meeting AAR standards.
75,001 lbs. to 160,000 lbs. use minimum Level #3 air bags.
160,001 lbs. to 205,000 lbs. use minimum Level #4 air bags

Four 29” wide AAR approved corrugated contour buffer pads approximately the height of the lading.

Twelve 29” wide AAR approved corrugated filler pads.
One AAR approved 22” thick corrugated end wall filler pads.
Use two 36'' wide disposable dunnage bags meeting AAR standards.

75,001 lbs. to 160,000 lbs. use minimum Level #3 air bags.

160,001 lbs. to 205,000 lbs. use minimum Level #4 air bags

Align dunnage bag centers and adjacent roll centers.

Inflate dunnage bags to 8 PSI. Keep dunnage bag void between 4" to 12".

Secure dunnage bags a minimum of 1" from the floor.

Ensure that dunnage bags do not exceed the height of the lading or contour buffers and that the bags are as close to the height of the load.

Voids exceeding 12 inches require additional AAR approved 3” thick corrugated or honeycomb filler pads, with a maximum of three fillers on each side of the dunnage bag. Place additional filler pads between rolls.

Voids less than 4 inches require a 19 roll pattern.

AAR approved doorway protection materials if indicated in the doorway protection data item above.

Use two 36” wide disposable dunnage bags meeting AAR standards.

75,001 lbs. to 160,000 lbs. use minimum Level #3 air bags.

160,001 lbs. to 205,000 lbs. use minimum Level #4 air bags

Four 29” wide AAR approved corrugated contour buffer pads approximately the height of the lading.

Twelve 29” wide AAR approved corrugated filler pads.

One AAR approved 22” thick corrugated end wall filler pads.
**COMMODITIES:**

- NEWS PRINT
- PRINTING PAPER
- PULP BOARD
- LINER BOARD
- MEDIUM
- PULP

**DOOR TYPE:**

- SINGLE SLIDING
- DOUBLE SLIDING

**DOORWAY PROTECTION:**

- YES
- NO

**DOOR WIDTH:**

- 8 FOOT
- 10 FOOT
- 12 FOOT
- 16 FOOT

**DRAFT GEAR TYPE:**

- STANDARD
- END OF CAR
- CUSHION UNDERFRAME

**KEYS TO SUCCESS**

Place 2 x 4 x 48" wooden or fiber spacer upright in each end between first roll and side wall to prevent wedging.

Place 36" long wooden or fiber fillers on both sides of the doorway to facilitate removal of the first roll.

**“WHAT IF” LOADING ALTERNATIVES**

- Rolls too tight to allow for placement of lumber filler requires a 19 roll pattern.

- Rolls too loose require additional lumber fillers.

**BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)**

- AAR approved 1 ¾” x .031 steel banding for doorway protection if indicated in the doorway protection data item above.
- Two AAR approved 2 x 4 x 48” wooden or fiber wall spacers.
- AAR approved 36” long wooden or fiber void fillers.
**COMMODITIES:**

<table>
<thead>
<tr>
<th>NEWS PRINT</th>
<th>PRINTING PAPER</th>
<th>PULP BOARD</th>
<th>LINER BOARD</th>
<th>MEDIUM</th>
<th>PULP</th>
</tr>
</thead>
</table>

**DOOR TYPE:**

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<thead>
<tr>
<th>SINGLE SLIDING</th>
<th>DOUBLE SLIDING</th>
<th>SINGLE PLUG</th>
<th>DOUBLE PLUG</th>
<th>COMBO</th>
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</thead>
</table>

**DOORWAY PROTECTION:**

<table>
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</table>

**DOOR WIDTH:**

<table>
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<tr>
<th>8 FOOT</th>
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**DRAFT GEAR TYPE:**

<table>
<thead>
<tr>
<th>STANDARD</th>
<th>END OF CAR</th>
<th>CUSHION UNDERFRAME</th>
<th>X</th>
<th>MEANS YES</th>
</tr>
</thead>
</table>

**KEYS TO SUCCESS**

Place 2 x 4 x 48” wooden or fiber spacer upright in each end between first roll and side wall to prevent wedging.

Place 36” long wooden or fiber fillers on both sides of the doorway to facilitate removal of the first roll.

**“WHAT IF” LOADING ALTERNATIVES**

Rolls too tight to allow for placement of lumber filler requires a 19 roll pattern.

Rolls too loose requires additional lumber fillers.

**BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)**

AAR approved 1 ¾” x .031 steel banding for doorway protection if indicated in the doorway protection data item above.

Two AAR approved 2 x 4 x 48” wooden or fiber wall spacers.

AAR approved 36” long wooden or fiber void fillers.
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## 60" Diameter

<table>
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<tbody>
<tr>
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<td>19 Roll</td>
<td>Dunnage Bags</td>
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<tr>
<td>2</td>
<td>50'6&quot; x 9'6&quot;</td>
<td>19 Roll</td>
<td>Lumber Filler</td>
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<tr>
<td>3</td>
<td>50'6&quot; x 9'2&quot;</td>
<td>17 Roll</td>
<td>Key Anchor Application</td>
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<tr>
<td>4</td>
<td>50'6&quot; x 9'4&quot;</td>
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<td>5</td>
<td>50'6&quot; x 9'6&quot;</td>
<td>19 Roll</td>
<td>Key Anchor Application</td>
</tr>
</tbody>
</table>
(This Page Left Blank Intentionally.)
Use nine (9) steel bands to anchor rolls at the doorposts.

Use 2” x 4” wood uprights or other adequate material as band stays at the face of the shaded rolls to keep straps in place during transit.

NOTE: Key/anchor bands in this method can also be considered doorway protection.

**KEYS TO SUCCESS**

**“WHAT IF” LOADING ALTERNATIVES**

**BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)**

AAR approved 1 1/4” x .031” steel banding and seals for key/anchor bands.

Two suitable upright spacers between the bands and the rolls within the key/anchor.

Staples or nails to secure bands to upright spacers.
Use nine (9) steel bands to anchor rolls at the doorposts.

Use 2" x 4" wood uprights or other adequate material as band stays at the face of the shaded rolls to keep straps in place during transit.

NOTE: Key/anchor bands in this method can also be considered doorway protection.

"WHAT IF" LOADING ALTERNATIVES

<table>
<thead>
<tr>
<th>BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAR approved 1 1/4&quot; x .031 &quot; steel banding and seals for key/anchor bands.</td>
</tr>
<tr>
<td>Two suitable upright spacers between the bands and the rolls within the key/anchor.</td>
</tr>
<tr>
<td>Staples or nails to secure bands to upright spacers.</td>
</tr>
</tbody>
</table>
Use nine (9) steel bands to anchor rolls at the doorposts.

Use 2” x 4” wood uprights or other adequate material as band stays at the face of the shaded rolls to keep straps in place during transit.

NOTE: Key/anchor bands in this method can also be considered doorway protection.

“WHAT IF” LOADING ALTERNATIVES

BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)

AAR approved 1 1/4” x .031 “ steel banding and seals for key/anchor bands.

Two suitable upright spacers between the bands and the rolls within the key/anchor.

Staples or nails to secure bands to upright spacers.
**KEYS TO SUCCESS**

Place 2” x 6” x 36” long wood filler on edge on both sides of the doorway rolls to facilitate removal of first roll.

**“WHAT IF” LOADING ALTERNATIVES**

**BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)**

AAR approved doorway protection if indicated in the doorway protection data item above.

2” x 6” x 36” wood spacers.
Align dunnage bag centers and adjacent roll centers.

Inflate dunnage bag to 8 PSI. Keep dunnage bag voids between 4” to 12”.

Secure dunnage bags to a minimum of 1” from the floor.

Ensure that dunnage bags do not exceed height of lading or contour buffers and that the bags are as close to the height of the load.

"WHAT IF" LOADING ALTERNATIVES

Rolls too loose require wooden or fiber fillers (2x4x48”) in each end between first roll and side wall. Also prevents wedging.

BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)

AAR approved doorway protection materials if indicated in the doorway protection data item above.

Use two 36” wide disposable dunnage bags meeting AAR standards.
75,001 lbs. to 160,000 lbs. use minimum Level #3 air bags.
160,001 lbs. to 205,000 lbs. use minimum Level #4 air bags

Four 30” AAR approved corrugated contour buffer pads approximately the height of the lading.

Use 30” wide AAR approved corrugated filler pads.
<table>
<thead>
<tr>
<th>Page</th>
<th>Car Size</th>
<th>Load Patterns</th>
<th>Securement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50'6&quot; x 9'6&quot;</td>
<td>10 Roll</td>
<td>Key Anchor Application</td>
</tr>
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</table>
Use nine (9) steels bands to anchor rolls at the doorposts.

When rolls consists of varied diameters, place stacks with the largest diameter rolls at the doorposts and in the doorway area.

Use 2” x 4” uprights or other adequate material as band stays at the face of the shaded roll to keep straps in place during transit.

NOTE: Key/anchor bands in this method can also be considered doorway protection.

"WHAT IF" LOADING ALTERNATIVES

BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)

AAR approved 1 1/4” x .031 steel banding and seals for key/anchor bands.

Two suitable upright spacers between the bands and the rolls within the key/anchor.

Staples or nails to secure bands to upright spacers.
40" Diameter

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<td>60'9&quot; x 9'6&quot;</td>
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<td>Non-Metallic Band or Steel Band Application</td>
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<tr>
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### DOOR WIDTH:

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<tbody>
<tr>
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### DRAFT GEAR TYPE

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<th>End of Car</th>
<th>Cushion Underframe</th>
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<td>CUSHION UNDERFRAME</td>
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<td>MEANS YES</td>
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</table>

### KEYS TO SUCCESS

Inflate dunnage bags to 8 PSI. Keep dunnage bag void between 4" to 12".

Use one bag per layer and secure dunnage bag a minimum of 1" from the floor.

Ensure that dunnage bag does not exceed the height of the lading.

End wall rolls loaded along center line must touch and be centered along car center line.

### “WHAT IF” LOADING ALTERNATIVES

### BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)

Use the appropriate level of air bags for the following load weights:

- 75,001 lbs. to 160,000 lbs. use minimum Level #3 air bags
- 160,001 lbs. to 205,000 lbs. use minimum Level #4 air bags

AAR approved doorway protection materials if indicated in doorway protection data above.

18” wide corrugated contour buffer pads approximately the height of the lading.
**Keys to Success**

Inflate dunnage bags to 8 PSI. Keep dunnage bag void between 4" to 12".

Use one bag per layer and secure dunnage bag a minimum of 1" from the floor.

Ensure that dunnage bag does not exceed the height of the lading.

End wall rolls loaded along center line must touch and be centered along car center line.

**“What If” Loading Alternatives**

**Blocking and Bracing Materials Required (See Section 4 for Installation Data)**

Use the appropriate level of air bags for the following load weights:
- 75,001 lbs. to 160,000 lbs. use minimum Level #3 air bags
- 160,001 lbs. to 205,000 lbs. use minimum Level #4 air bags

AAR approved doorway protection materials if indicated in doorway protection data above.

18” wide corrugated contour buffer pads approximately the height of the lading.
**COMMODITIES:**
- NEWS
- PRINT
- PRINTING PAPER
- PULP BOARD
- LINER BOARD
- MEDIUM
- PULP

**DOOR TYPE:**
- SINGLE SLIDING
- DOUBLE SLIDING
- SINGLE PLUG
- DOUBLE PLUG
- COMBO

**DOORWAY PROTECTION:**
- YES
- NO

**DOOR WIDTH:**
- 8 FOOT
- 10 FOOT
- 12 FOOT
- 16 FOOT

**DRAFT GEAR TYPE**
- STANDARD
- END OF CAR
- CUSHION UNDERFRAME
- MEANS YES

**KEYS TO SUCCESS**

Ensure that the left and right side rolls of each set encircled by each unit band do not touch.

Secure the unit bands in position.

Ensure that all rolls loading ahead of doorposts are unitized.

**NOTE:** Key bands in the method can also be considered doorway protection if they encompass all the doorway rolls.

**“WHAT IF” LOADING ALTERNATIVES**

---

**BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)**

AAR approved non-metallic bands or approved 1 ¼” x .031 steel bands.
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### 42" Diameter

<table>
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<th>Securement</th>
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<td>60'9&quot; x 9'6&quot;</td>
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<td>Non-Metallic Band Application</td>
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<td>60'9&quot; x 9'6&quot;</td>
<td>44 Roll</td>
<td>Non-Metallic or Steel Band Application</td>
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</tbody>
</table>
(This page left blank intentionally)
KEYS TO SUCCESS

Inflate dunnage bags to 8 PSI. Keep dunnage bag void between 4” to 12”.

Use one bag per layer and secure dunnage bag a minimum of 1” from the floor.

Ensure that dunnage bag does not exceed the height of the lading.

“WHAT IF” LOADING ALTERNATIVES

BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)

Use Level # 5 air bags only.

AAR approved doorway protection materials if indicated in doorway protection data above.

Sufficient number of 18” wide corrugated contour buffer pads approximately the height of the lading to fill voids between doorpost rolls and doorway rolls.
### COMMODITIES:
- NEWS PRINT
- PRINTING PAPER
- PULP BOARD
- LINER BOARD
- MEDIUM PULP

### DOOR TYPE:
- SINGLE SLIDING
- DOUBLE SLIDING
- SINGLE PLUG
- DOUBLE PLUG
- COMBO

### DOORWAY PROTECTION:
- YES
- NO

### DOOR WIDTH:
- 8 FOOT
- 10 FOOT
- 12 FOOT
- 16 FOOT

### DRAFT GEAR TYPE
- STANDARD
- END OF CAR
- CUSHION UNDERFRAME

### KEYS TO SUCCESS
- Inflate dunnage bags to 8 PSI. Keep dunnage bag void between 4" to 12".
- Use one bag per layer and secure dunnage bag to a minimum of 1" from the floor.
- Ensure that dunnage bag does not exceed the height of the lading.

### “WHAT IF” LOADING ALTERNATIVES

### BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)
- Use Level # 5 air bags only.
- AAR approved doorway protection materials if indicated in doorway protection data above.
- Sufficient number of 18” wide corrugated contour buffer pads approximately the height of the lading to fill voids between doorpost rolls and doorway rolls.
### Keys to Success

Inflate dunnage bags to 8 PSI. Keep dunnage bag void between 4" to 12".

Use one bag per layer and secure dunnage bag to a minimum of 1" from the floor.

Ensure that dunnage bag does not exceed the height of the lading.

Secure non-metallic banding in position to prevent against falling.

### “What If” Loading Alternatives

### Blocking and Bracing Materials Required (See Section 4 for Installation Data)

Use Level #5 air bags only.

AAR approved doorway protection materials if indicated in doorway protection data above.

AAR approved non-metallic banding for unitizing rolls.

Tape or other suitable securement device to secure bands in position.
**42” DIAMETER**  
**60-9 X 9-6 RAIL CAR**  
**NON-METALLIC OR STEEL BAND APPLICATION**  
**44 ROLL PATTERN**

---

**KEYS TO SUCCESS**

Ensure that the left and right side rolls of each set encircled by each unit band do not touch. (five roll set)

Ensure that the two rolls of each unit band do not touch. (Two roll set)

Secure the unit bands in position.

Ensure that all rolls ahead of the doorposts are unitized.

NOTE: Key bands in the method can also be considered doorway protection if they encompass all the doorway rolls.

---

**“WHAT IF” LOADING ALTERNATIVES**

---

**BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)**

AAR approved non-metallic bands or approved 1 ¼” x .031 steel bands.
### 45" Diameter

<table>
<thead>
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<th>Page</th>
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<td>60'9&quot; x 9'6&quot;</td>
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Loading Roll Paper in Rail Cars

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### KEYS TO SUCCESS

Inflate dunnage bags to 8 PSI. Keep dunnage bag void between 4" to 12".

Use one bag per layer and secure dunnage bag a minimum of 1" from the floor.

Ensure that dunnage bag does not exceed the height of the lading.

### "WHAT IF" LOADING ALTERNATIVES

| Blocking and Bracing Materials Required (See Section 4 For Installation Data)

Use Level # 5 air bags only.

AAR approved doorway protection materials if indicated in doorway protection data above.

Sufficient number of 18” wide corrugated contour buffer pads approximately the height of the lading to fill voids between doorpost rolls and doorway rolls.
KEYS TO SUCCESS

Inflated dunnage bags to 8 PSI. Keep dunnage bag void between 4" to 12".

Use one bag per layer and secure dunnage bag a minimum of 1" from the floor.

Ensure that dunnage bag does not exceed the height of the lading.

“WHAT IF” LOADING ALTERNATIVES

BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)

Use Level # 5 air bags only.

AAR approved doorway protection materials if indicated in doorway protection data above.

Sufficient number of 18” wide corrugated contour buffer pads approximately the height of the lading to fill voids between doorpost rolls and doorway rolls.
### Keys to Success

Inflate dunnage bags to 8 PSI. Keep dunnage bag void between 4” to 12”.

Use one bag per layer and secure dunnage bag to a minimum of 1” from the floor.

Ensure that dunnage bag does not exceed the height of the lading.

### “What If” Loading Alternatives


### Blocking and Bracing Materials Required (See Section 4 for Installation Data)

Use Level #5 air bags only.

AAR approved doorway protection materials if indicated in doorway protection data above.
### COMMODITIES:
- NEWS PRINT: X
- PRINTING PAPER: X
- PULP BOARD: X
- LINER BOARD: X
- MEDIUM: X
- PULP: X

### DOOR TYPE:
- SINGLE SLIDING: X
- DOUBLE SLIDING: X
- SINGLE PLUG: X
- DOUBLE PLUG: X
- COMBO: X

### DOORWAY PROTECTION:
- YES: X
- NO: X

### DOOR WIDTH:
- 8 FOOT: X
- 10 FOOT: X
- 12 FOOT: X
- 16 FOOT: X

### DRAFT GEAR TYPE
- STANDARD: X
- END OF CAR: X
- CUSHION UNDERFRAME: X

### KEYS TO SUCCESS

Ensure that the two rolls encircled by each unit do not touch.

Secure the unit bands in position.

Ensure that all rolls loaded ahead of the doorposts are unitized.

NOTE: Key bands in the method can also be considered doorway protection if they encompass all the doorway rolls.

### “WHAT IF” LOADING ALTERNATIVES

### BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)

AAR approved non-metallic bands or 1 ¼” x .031 steel banding and seals for unit bands.

Kraft paper or other suitable material to cover inside of bands and seals.

Tape or other suitable material to secure bands to prevent falling.
### KEYS TO SUCCESS

Use seven (7) AAR approved polyester cord straps to anchor rolls at wall anchors.

Install straps as closely as possible to the following heights from floor: 15”, 60”, 90”, 100”, 110”, 120”, 130”. Regardless of roll width, the topmost five (5) straps should be positioned above the middle line of the rolls with the topmost strap positioned as close to the top of the rolls as wall anchors permit.

Use wall anchor locations that are behind the last stack of rolls placed adjacent to the side walls.

Apply strap hangers or tape the straps to the rolls to minimize slippage of the straps.

### WHAT IF LOADING ALTERNATIVES

---

### BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)

AAR approved 1 ½” wide polyester cord straps for key/anchor.

Tape or suitable strap hangers.
## 48" Diameter

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<th>Car Size</th>
<th>Load Patterns</th>
<th>Securement</th>
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<td>60'9&quot; x 9'6&quot;</td>
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<tr>
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<td>60'9&quot; x 9'6&quot;</td>
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**KEYS TO SUCCESS**

Inflate dunnage bags to 8 PSI. Keep dunnage bag void between 4" to 12".

Use one bag per layer and secure dunnage bag to a minimum of 1" from the floor.

Ensure that dunnage bag does not exceed the height of the lading.

**“WHAT IF” LOADING ALTERNATIVES**

**BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)**

Use Level #5 air bags only.

AAR approved doorway protection materials if indicated in doorway protection data above.
**48” DIAMETER**  **60-9 X 9-6 RAIL CAR**  **DUNNAGE BAG APPLICATION**  **31 ROLL PATTERN**

### COMMODITIES:
- NEWS PRINT
- PRINTING PAPER
- PULP BOARD
- LINER BOARD
- MEDIUM
- PULP

### DOOR TYPE:
- SINGLE SLIDING
- DOUBLE SLIDING
- SINGLE PLUG
- DOUBLE PLUG
- COMBO

### DOORWAY PROTECTION:
- YES
- NO

### DOOR WIDTH:
- 8 FOOT
- 10 FOOT
- 12 FOOT
- 16 FOOT

### DRAFT GEAR TYPE
- STANDARD
- END OF CAR
- CUSHION UNDERFRAME

### KEYS TO SUCCESS

Inflate dunnage bags to 8 PSI. Keep dunnage bag void between 4” to 12”.

Use one bag per layer and secure dunnage bag to a minimum of 1” from the floor.

Ensure that dunnage bag does not exceed the height of the lading.

### “WHAT IF” LOADING ALTERNATIVES

### BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)

Use Level #5 air bags only.

AAR approved doorway protection materials if indicated in doorway protection data above.
48" DIAMETER  60-9 X 9-6 RAIL CAR  DUNNAGE BAG APPLICATION  31 ROLL PATTERN

COMMODITIES: NEWS PRINT  X  PRINTING PAPER  X  PULP BOARD  LINER BOARD  MEDIUM  PULP

DOOR TYPE: SINGLE SLIDING  X  DOUBLE SLIDING  SINGLE PLUG  X  DOUBLE PLUG  COMBO

DOORWAY PROTECTION: YES  NO

DOOR WIDTH: 8 FOOT  10 FOOT  X  12 FOOT  16 FOOT

DRAFT GEAR TYPE: STANDARD  END OF CAR  X  CUSHION UNDERFRAME  X  X MEANS YES

KEYS TO SUCCESS

Inflate dunnage bags to 8 PSI. Keep dunnage bag void between 4" to 12".

Use one bag per layer and secure dunnage bag to a minimum of 1" from the floor.

Ensure that dunnage bag does not exceed the height of the lading.

“What IF” LOADING ALTERNATIVES

BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)

Use Level # 5 air bags only.

AAR approved doorway protection materials if indicated in doorway protection data above.
**KEYS TO SUCCESS**

Inflate dunnage bags to 8 PSI. Keep dunnage bag void between 4" to 12".

Use one bag per layer and secure dunnage bag to a minimum of 1" from the floor.

Ensure that dunnage bag does not exceed the height of the lading.

**“WHAT IF” LOADING ALTERNATIVES**

**BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)**

Use Level #5 air bags only.

AAR approved doorway protection materials if indicated in doorway protection data above.
## 50” Diameter

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<td>Wall Anchor Application</td>
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50" DIAMETER  60-9 X 9-6 RAIL CAR  DUNNAGE BAG APPLICATION  28 ROLL PATTERN

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DOORWAY PROTECTION:

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DOOR WIDTH:

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DRAFT GEAR TYPE

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KEYS TO SUCCESS

Inflate dunnage bags to 8 PSI. Keep dunnage bag void between 4" to 12".

Use one bag per layer and secure dunnage bag a minimum of 1" from the floor.

Ensure that dunnage bag does not exceed the height of the lading.

“WHAT IF” LOADING ALTERNATIVES

<table>
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<tr>
<th>BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)</th>
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<tbody>
<tr>
<td>Use the appropriate level of air bags for the following load weights:</td>
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<tr>
<td>75,001 lbs. to 160,000 lbs. use minimum Level #3 air bags</td>
</tr>
<tr>
<td>160,001 lbs. to 205,000 lbs. use minimum Level #4 air bags</td>
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</tbody>
</table>

AAR approved doorway protection materials if indicated in doorway protection data above. 18” wide corrugated contour buffer pads approximately the height of the lading.
KEYS TO SUCCESS

Inflate dunnage bags to 8 PSI. Keep dunnage bag void between 4" to 12".

Use one bag per layer and secure dunnage bag to a minimum of 1" from the floor.

Ensure that dunnage bag does not exceed the height of the lading.

“What IF” LOADING ALTERNATIVES

BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)

Use Level # 5 air bags only.

AAR approved doorway protection materials if indicated in doorway protection data above.
**50” DIAMETER**
132” Wide or Less

**60-9 X 9-6 RAIL CAR**

**WALL ANCHOR APPLICATION**

**MULTIPLE ROLL PATTERN**

---

**COMMODITIES:**
- NEWS PRINT
- PRINTING PAPER
- PULP BOARD
- LINER BOARD
- MEDIUM
- PULP

**DOOR TYPE:**
- SINGLE SLIDING
- DOUBLE SLIDING
- SINGLE PLUG
- DOUBLE PLUG
- COMBO

**DOORWAY PROTECTION:**
- NO
- NO
- NO
- NO
- NO

**DOOR WIDTH:**
- 8 FOOT
- 10 FOOT
- 12 FOOT
- 16 FOOT

**DRAFT GEAR TYPE**
- STANDARD
- END OF CAR
- CUSHION UNDERFRAME

**KEYS TO SUCCESS**

Use seven (7) AAR approved polyester cord straps to anchor rolls at wall anchors.

Install straps as closely as possible to the following heights from floor: 15”, 60”, 90”, 100”, 110”, 120”, 130”. Regardless of roll width, the topmost five (5) straps should be positioned above the middle line of the rolls with the topmost strap positioned as close to the top of the rolls as wall anchors permit.

Use wall anchor locations that are behind the last stack of rolls placed adjacent to the side walls.

Apply strap hangers or tape the straps to the rolls to minimize slippage of the straps.

**“WHAT IF” LOADING ALTERNATIVES**

**BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)**

AAR approved 1 ½” wide polyester cord straps for key/anchor.

Tape or suitable strap hangers.
## 58” Diameter

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<td>3</td>
<td>60'9&quot; x 9'6&quot;</td>
<td>24 Roll</td>
<td>Lumber or Corrugated Fiber Spacer Application</td>
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<tr>
<td>4</td>
<td>60'9&quot; x 9'6&quot;</td>
<td>24 Roll</td>
<td>Lumber or Corrugated Fiber Spacer Application</td>
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</tbody>
</table>
(This page left blank intentionally)
**KEYS TO SUCCESS**

- Align dunnage bag centers and adjacent roll centers.
- Inflated dunnage bags to 8 PSI. Keep the dunnage bag void between 4" to 12".
- Secure the dunnage bag a minimum of 1" from the floor.
- Ensure that the dunnage bag does not exceed the height of the lading.
- Place 22" thick corrugated filler end wall filler pads in each end between first roll and end wall to prevent wedging.

**“WHAT IF” LOADING ALTERNATIVES**

**BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)**

Use the appropriate level of air bags for the following load weights:
- 75,001 lbs. to 160,000 lbs. use minimum Level #3 air bags
- 160,001 lbs. to 205,000 lbs. use minimum Level #4 air bags

AAR approved doorway protection materials if indicated in doorway protection data above.

Sufficient number of 29” wide corrugated contour buffer pads and corrugated fillers approximately the height of the lading.

Two AAR approved 22” thick corrugated end wall filler pads.
### KEYS TO SUCCESS

- Align dunnage bag centers and adjacent roll centers.
- Inflate dunnage bags to 8 PSI. Keep dunnage bag void between 4” to 12”.
- Secure dunnage bag a minimum of 1” from the floor.
- Ensure that dunnage bag does not exceed the height of the lading.
- Place 2” x 4” x 48” wooden or fiber spacer upright in each end between first roll and side wall to prevent wedging.

### “WHAT IF” LOADING ALTERNATIVES

### BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)

Use the appropriate level of air bags for the following load weights:
- 75,001 lbs. to 160,000 lbs. use minimum Level #3 air bags
- 160,001 lbs. to 205,000 lbs. use minimum Level #4 air bags

AAR approved doorway protection materials if indicated in doorway protection data above.

Sufficient number of 29” wide corrugated contour buffer pads and corrugated fillers approximately the height of the lading.
**KEYS TO SUCCESS**

Place 2” x 4” x 48” wooden or fiber spacer upright in each end between first roll and side wall to prevent wedging.

Place 36” long wooden or fiber fillers on both sides of doorway rolls to facilitate removal of first roll.

**“WHAT IF” LOADING ALTERNATIVES**

**BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)**

AAR approved 1/4” x .031” steel or non-metallic banding for doorway protection if indicated in doorway protection data above.

Two AAR approved 2” x 4” x 48” wooden or fiber wall spacers.

AAR approved 36” long wooden or fiber void fillers.
**58” DIAMETER**

**60-9 X 9-6 RAIL CAR**

**LUMBER OR CORRUGATED FIBER SPACER APPLICATION**

**24 ROLL PATTERN**

---

**COMMODITIES:**

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**DOOR TYPE:**

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**DOORWAY PROTECTION:**

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**DOOR WIDTH:**

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**DRAFT GEAR TYPE**

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**KEYS TO SUCCESS**

Place 2” x 4” x 48” wooden or fiber spacer upright in each end between first roll and end wall to prevent wedging.

Place 36” long wooden or fiber fillers on both sides of doorway rolls to facilitate removal of first roll.

Place 22” thick corrugated filler end wall filler pads in each end between first roll and end wall to prevent wedging.

---

**“WHAT IF” LOADING ALTERNATIVES**

---

**BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)**

AAR approved 1 ¼” x .031” steel or non-metallic banding for doorway protection if indicated in doorway protection data above.

Two AAR approved 2” x 4” x 48” wooden or fiber wall spacers.

AAR approved 36” long wooden or fiber void fillers.

Two AAR approved 22” thick corrugated end wall filler pads.
## 59" Diameter

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<td>Key/Anchor Application</td>
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### KEYS TO SUCCESS

Place 2” x 4” x 48” wooden or fiber spacer upright in each end between first roll and side wall to prevent wedging.

Use nine 1 ¼” x .031” steel bands to anchor rolls at doorposts.

Place 2” x 4” wood uprights or other adequate material as band stays at the face of the shaded roll to keep straps in place during transit.

**NOTE:** Key/anchor bands in this method can also be considered doorway protection.

### “WHAT IF” LOADING ALTERNATIVES

### BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)

AAR approved 1 ¼” x .031” steel banding and seals for key/anchor.

Two AAR approved 2” x 4” x 48” wooden or fiber wall spacers.

Two suitable upright spacers between the bands and the rolls within the key/anchor.

Staples or nails to secure bands to upright spacers.
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### 60" Diameter

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<td>Key/Anchor Application</td>
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## KEYS TO SUCCESS

Use nine 1 ¼” x .031” steel bands to anchor rolls at doorposts.

Place 2” x 4” wood uprights or other adequate material as band stays at the face of the shaded roll to keep straps in place during transit.

**NOTE:** Key/anchor bands in this method can also be considered doorway protection.

### “WHAT IF” LOADING ALTERNATIVES

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<th>blocking and bracing materials required (see section 4 for installation data)</th>
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<tbody>
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<tr>
<td>Two suitable upright spacers between the bands and the rolls within the key/anchor.</td>
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<td>Staples or nails to secure bands to upright spacers.</td>
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## 65” Diameter

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**65” DIAMETER**

**60-9 X 9-4 RAIL CAR**

**KEY/ANCHOR APPLICATION**

**15 ROLL PATTERN**

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**DOORWAY PROTECTION:**

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**DRAFT GEAR TYPE**

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**KEYS TO SUCCESS**

Use nine 1¼” x .031” steel bands to anchor rolls at doorposts.

Place 2” x 4” wood uprights or other adequate material as band stays at the face of the shaded roll to keep straps in place during transit.

**NOTE:** Key/anchor bands in this method can also be considered doorway protection.

---

**“WHAT IF” LOADING ALTERNATIVES**

---

**BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)**

AAR approved 1¼” x .031” steel banding and seals for key/anchor.

Two suitable upright spacers between the bands and the rolls within the key/anchor.

Staples or nails to secure bands to upright spacers.
**65" DIAMETER** | **60-9 X 9-6 RAIL CAR** | **KEY/ANCHOR APPLICATION** | **16 ROLL PATTERN**

---

**COMMODITIES:**
- NEWS PRINT
- PRINTING PAPER
- PULP BOARD
- LINER BOARD
- MEDIUM
- PULP

**DOOR TYPE:**
- SINGLE SLIDING
- DOUBLE SLIDING
- SINGLE PLUG
- DOUBLE PLUG
- COMBO

**DOORWAY PROTECTION:**
- NO
- NO

**DOOR WIDTH:**
- 8 FOOT
- 10 FOOT
- 12 FOOT
- 16 FOOT

**DRAFT GEAR TYPE**
- STANDARD
- END OF CAR
- CUSHION UNDERFRAME

**MEANS YES**

**KEYS TO SUCCESS**

Use nine 1 ¼” x .031” steel bands to anchor rolls at doorposts.

Place 2” x 4” wood uprights or other adequate material as band stays at the face of the shaded roll to keep straps in place during transit.

**NOTE:** Key/anchor bands in this method can also be considered doorway protection.

**“WHAT IF” LOADING ALTERNATIVES**

**BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)**

AAR approved 1 ¼” x .031” steel banding and seals for key/anchor.

Two suitable upright spacers between the bands and the rolls within the key/anchor.

Staples or nails to secure bands to upright spacers.
### 72" Diameter

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<td>Key/Anchor Application</td>
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</table>
**72" DIAMETER**  |  **60-9 X 9-6 RAIL CAR**  |  **KEY/ANCHOR APPLICATION**  |  **12 ROLL PATTERN**

---

### 商品分类（Commodities）
- 新闻纸（NEWS PRINT）
- 印刷纸（PRINTING PAPER）
- 原木浆（PULP BOARD）
- 林板（LINER BOARD）
- 中板（MEDIUM）
- 原木（PULP）

### 门类型（Door Type）
- 单门滑动（SINGLE SLIDING）
- 双门滑动（DOUBLE SLIDING）
- 单门插板（SINGLE PLUG）
- 双门插板（DOUBLE PLUG）
- 单门组合（SINGLE COMBO）

### 门道保护（Doorway Protection）
- 无（NO）

### 门窗宽度（Door Width）
- 8英尺（8 FOOT）
- 10英尺（10 FOOT）
- 12英尺（12 FOOT）
- 16英尺（16 FOOT）

### 导轨类型（Draft Gear Type）
- 标准（STANDARD）
- 端部（END OF CAR）
- 枕梁（CUSHION UNDERFRAME）

### 成功的关键（Keys to Success）

使用九根1 ¼” x .031”钢带将卷材固定在门柱上。

将2” x 4”木条或其它合适的材料作为钢带的支架，放置在条纹卷的正面，以保持带子在运输过程中的位置。

**注意**：钥匙/锚带在本方法中也可以作为门道保护。

### “如果”装载替代方案（"What If" Loading Alternatives）

---

### 阻挡和支撑材料所需的（Blocking and Bracing Materials Required）

- 符合AAR标准的1 ¼” x .031”钢带和密封件用于钥匙/锚。
- 适合的门间支撑在钢带和卷材之间的钢带。
- 钉子或钉子用于固定钢带到门之间支撑。
## 84" Diameter

<table>
<thead>
<tr>
<th>Page</th>
<th>Car Size</th>
<th>Load Patterns</th>
<th>Securement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>60'9&quot; x 9'6&quot;</td>
<td>9 Roll</td>
<td>Key/Anchor Application</td>
</tr>
<tr>
<td>2</td>
<td>60'9&quot; x 9'6&quot;</td>
<td>9 Roll</td>
<td>Key/Anchor Application</td>
</tr>
</tbody>
</table>
(This page left blank intentionally)
KEYS TO SUCCESS

Use nine 1 ¼” x .031” steel bands to anchor rolls at doorposts.

Place 2” x 4” wood uprights or other adequate material as band stays at the face of the shaded roll to keep straps in place during transit.

NOTE: Key/anchor bands in this method can also be considered doorway protection.

“What IF” LOADING ALTERNATIVES

BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)

AAR approved 1 ¼” x .031” steel banding and seals for key/anchor.

Two suitable upright spacers between the bands and the rolls within the key/anchor.

Staples or nails to secure bands to upright spacers.
**KEYS TO SUCCESS**

Use nine 1 ¼” x .031” steel bands to anchor rolls at doorposts.

Place 2” x 4” wood uprights or other adequate material as band stays at the face of the shaded roll to keep straps in place during transit.

**NOTE:** Key/anchor bands in this method can also be considered doorway protection.

**“WHAT IF” LOADING ALTERNATIVES**

**BLOCKING AND BRACING MATERIALS REQUIRED (SEE SECTION 4 FOR INSTALLATION DATA)**

AAR approved 1 ¼” x .031” steel banding and seals for key/anchor.

Two suitable upright spacers between the bands and the rolls within the key/anchor.

Staples or nails to secure bands to upright spacers.
SECTION NO. 7

GLOSSARY
AAR—Association of American Railroads

“A” END—The end of the rail vehicle opposite the “B” or brake end.

ABRASION—The damage caused by the scuffing, rubbing or scratching together of two or more objects.

AF&PA—American Forest & Paper Association

ABRASION RESISTANCE—Ability to withstand the effects of repeated rubbing, scuffing and scratching.

ADHESIVE—A term applied to all material used for adhering one surface to another.

ANCHOR PLATES—
\begin{itemize}
  \item Steel plates slotted to facilitate threading of straps and drilled to permit nailing to carposts or floor.
  \item Devices permanently attached to rail vehicle structure through which strapping may be placed to anchor load.
\end{itemize}

ANCHORED LOAD—A divided load in which steel strapping is secured to the rail vehicle side walls preventing movement of the lading.

ATR—Above top of rail.

AUXILIARY DOOR—The second door of a double door rail car. It is usually positioned nearest to the end wall of the rail car.

“B” END—The end of the rail car in which the hand brake is located

BANDS—See straps.

BASIS WEIGHT, PAPERBOARD—Weight of paperboard expressed in pounds per thousand square feet.

BASIS WEIGHT, PAPER—Weight of paper expressed in pounds per three thousand square feet.

BEARING PIECES—See risers.

BILGE—The bulging curved part of a roll.

BLOCKING—Restraining movement of lading using wood.

BLOCKING ROLL—An elevated roll used to secure an incomplete layer.

BRACING—Restraining movement of lading using materials and methods other than wood.

BRIDGE PLATE—Usually a reinforced steel plate, equipped with handling slots or rings, used to span the gap between dock and railroad vehicle for loading and unloading purposes.

BUFF—A term used to describe coupler/cushion units in compressed state.
BUFFER MATERIAL—A rigid sheet used to distribute forces from bracing to prevent lading from conforming to the shape of the bracing.

CAPACITY—The nominal carrying ability of a car in pounds. The capacity is stenciled on the outside of the car.

CAR LINING—A surface (wood, plastic or metal) fastened to the inside of the rail car superstructure forming the finished car interior.

CAR POSTS—Corner posts, interior posts and end posts are vertical steel or wood members of car superstructure. The inside and outside sheathing are attached to the car posts.

CHOCK BLOCKS—Concave or mitered blocking pieces used to secure rolls in position.

CONDENSATION—Moisture or liquid formed on surfaces due to difference in temperature in surface to ambient air.

CONSIGNEE—The company or person to whom articles are shipped (Receiver).

CONSIGNOR—The company or person by whom articles are shipped (Shipper).

CONTOUR BUFFER PAD—A fibreboard pad designed to fit the outside curvature of a roll used in conjunction with D.I.D. bags to prevent rotation of the bags.

CORE—A fiber or metal tube into which finished paper is wound onto.

CORE PLUG—A wood, composite, plastic or steel plug inserted into the ends of the core to provide additional strength.

CRIMP-TYPE SEAL JOINT—A method of joining two ends of steel strapping by applying pressure to a seal resulting in indentations in both the seal and the strapping.

CROSS BRACE—A single wood member applied crosswise of car against lading to secure it from lengthwise movement.

CROSSWISE VOID—The difference between the inside width of the rail vehicle and the width of the load.

CRUSHED CORE—The damage that occurs when the core within a roll of paper has been deformed.

CUSHION UNDERFRAME—Frame work of a rail car which carries the weight of the floor and body of the vehicle and which is designed to permit the control of slack and of energy absorption capacity, each to meet the most desirable operating conditions so as to prevent the shocks and impact stresses from damaging the car structures or its lading.

CUT SEAL—A seal used to join the two ends of steel strapping by applying pressure resulting in indentations which actually cut both the seal and the strapping. The completed joint is known as a notch-type joint.

DISPOSABLE INFLATABLE DUNNAGE (D.I.D.)—A bag designed to be capable of main-
taining a specified air pressure.

**DOCK PLATE**—See bridge plate.

**DOORPOST, NAILABLE STEEL**—Rail car doorposts provided with metal channels to accept nails for installation of steel strap doorway protection.

**DOORPOSTS**—Steel or wood uprights forming the sides of the door opening in closed rail vehicles.

**DOORWAY AREA**—That part of the rail vehicle that exists between doorposts.

**DOORWAY PROTECTION**—When there is a possibility of lading falling or rolling out of doorway or coming in contact with sliding side doors, opening must be protected with wood doorway protection, steel straps or other material of sufficient strength and number and adequately secured. Cars equipped with plug type doors loaded with cylindrical items require doorway protection unless specifically exempted by applicable loading methods.

**DOUBLE-DOOR CAR**—Boxcars having two side doors on each side of car. May be plug, sliding or combination of both.

**DRAFT**—A term used to describe a condition where coupler/draft gear/cushion unit is fully extended.

**DUNNAGE**—The material used to protect or support lading in the rail car.

**END-OF-CAR CUSHIONING DEVICE**—A unit installed at the ends of a car encompassing the draft gear that develops energy-absorbing capacity through a hydraulic piston arrangement supplemented by springs to assume positive repositioning of the unit.

**FIBREBOARD**—Fiber sheets which have been produced or laminated to a thickness which provides a degree of stiffness.

**FLAT BAG**—A pneumatic dunnage bag used in a load that arrives at its destination with a puncture or burst and cannot hold air.

**FPAC**—Forest Product Association of Canadian.

**FRICTION SEAL**—A type of seal for joining two ends of steel or plastic strapping that has a substance on the inside face, such as a grit, to improve the holding strength of this seal. Used with crimp-type joints.

**GROSS WEIGHT**—The weight of a car together with the weight of its entire contents.

**HEADER**—A fiber board cap used to protect the ends of roll paper.

**INCOMPLETE LAYER**—One or more stacks that do not extend the full length of the rail car.

**INFLATABLE DUNNAGE**—See pneumatic dunnage.

**JOINT STRENGTH**—The force required to break a steel strap, at the joint, in pounds. This is
usually the weakest part of a sealed strap.

**KEY ROLL STRAPPING**—A method of securing rolls in the doorway section of the rail car. Rolls on opposite sides of the rail car are pulled together by tensioning of straps which lock the load together and takes up any remaining lengthwise space.

**KRAFT**—A chemical wood pulp made by the sulphate process, or paper or paperboard made from such pulp. It is brown in color.

**“L” SIDE** — Left side. That side of the rail car on the left side of the observer when standing inside of the car facing the A-end.

**LATERAL BLOCKING AND/OR BRACING**—Materials used to prevent crosswise movement.

**LATERAL VOID**—See crosswise void.

**LAYER**—A single course of rolls.

**LAYER NUMBERING**—Layers numbered consecutively from the floor upward.

**LENGTHWISE VOID**—That portion of lengthwise space not taken up by lading.

**LIGHT WEIGHT**—The actual weight of an empty rail car.

**LINING**—A surface (usually wood or metal) fastened to the inside of the rail car superstructure.

**LOAD LIMIT**—Maximum total weight of lading and dunnage material which may be loaded in a rail car. It is stenciled on the outside wall of the rail car.

**LOADING PLAN**—A predetermined plan for placement of rolls in a rail car.

**LONGITUDINAL BLOCKING AND/OR BRACING**—Materials used to prevent lengthwise movement.

**LONGITUDINAL VOID**—See lengthwise void.

**MARKED CAPACITY**—The nominal capacity of a rail car as marked or stenciled on the outside of the rail car.

**MINIMUM JOINT STRENGTH**—The minimum tensile strength requirement of a joint of a sealed steel strap.

**NOTCH-TYPE JOINT**—A method of joining two ends of steel strapping by applying pressure to a cut seal resulting in indentations which actually cut both the seal and the strap.

**OFF DOOR**—Rail car door opposite that through which the actual loading or unloading has taken place.

**ON SIDE LOAD**—A load in which rolls are loaded on their sides or on the round.
OVERLOAD—The load exceeds the stenciled load limit.

PACKING LIST—A detailed list of rolls as to rolls loaded.

PAD—A corrugated or solid fibreboard sheet or other material used for extra protection.

PAPER—The name for all kinds of matted or felted sheets of fiber formed on a fine wire screen from a water suspension.

PARTIAL LAYER—A layer comprised of one or more rolls, but which does not occupy the full width and/or length of the rail car.

PERMANENT ANCHOR PLATES—Fixtures attached to the rail car superstructure to which straps may be secured.

PLUG DOOR—A boxcar door having an interior surface flush with car lining when door is closed.

PNEUMATIC DUNNAGE—A bag capable of maintaining a specified air pressure.

P.S.I.G.—Pounds per square inch. Used to signify the pressure reading from a pressure gauge.

QLT—Quality Lead Team for the Prevention of Damage to Paper Products.

R SIDE—Right Side. That side of the rail car on the right of the observer when standing inside of the rail car and facing the A end.

RECESSED METHOD—An arrangement of rolls whereby they are loaded successively in voids of preceding stacks.

RETAINING STRIP—A barrier of heavy kraft paper reinforced with steel strapping which is nailed across rail car door to prevent lading moving into door or doorposts.

RISER—Corrugated fibreboard or wood used to elevate a roll or stack of rolls.

SIDE BRACING—Bracing material used to prevent crosswise movement of lading.

SPACE FILLERS—Those structures or material used to fill lengthwise or crosswise voids.

STACK—One or more layers of rolls occupying one place or floor spot in the rail car.

STRAPPING, NON METALLIC—Strapping made of material such as nylon, polypropylene, rayon, polyester, etc. other than metal.

STRAPPING, STEEL—Flat steel band designed for application with tensioning tools.

STRAP HOLDER—Banding, rope, wire or tape used to prevent straps from falling or becoming dislodged.

TARE WEIGHT—The weight of the car exclusive of its contents.
**TENSILE STRENGTH**—The force in pounds required to break a strap under a constant pulling action.

**THROUGH LOAD**—A load in which no lengthwise space is left in the rail car.

**TIGHT LOAD**—A load which fits the rail car tightly lengthwise and crosswise.

**VOID**—An open area in a load, either lengthwise or crosswise.

**VOID FILLER**—Dunnage material used to fill voids within a load.
DAMAGE DESCRIPTION DEFINITIONS—

CHAIFE—Abrasion by rubbing of one roll against another roll or against some other object.

CONCEALED DAMAGE—Damage which is discovered after delivery to the ultimate consignee, (on rolls of paper transported to destination point without valid exception).

CONTAMINATION—Any matter which is foreign to or deleterious to the roll of paper.

CRUSHED CORE—A crushed core is one that is deformed or out of round. A crushed core cannot be properly mounted on the unwind stand. The chuck and/or shaft used to hold the roll for feeding the press or converting machinery cannot be properly seated into the core of the roll.

CUTS—Cut damage is a smooth edged perforation on the roll of paper commonly caused by a sharp edged instrument.

DAMAGED ROLL—A roll that has not retained all its required characteristics at point of final use.

EDGE CRUSH—Compaction of paper occurring at either the top or bottom edge of the roll.

FLAT SPOT—A flat distortion of the otherwise normal curvature of the roll's circumference.

GOUGE—Breakage of paper on the side or end of a roll caused by a digging or chiseling action.

SPLIT EDGE—Breakage of paper occurring at either the top or bottom edge of the roll.

STARRING—A deformation of the circles formed by plies of paper observed from the end of the roll.

TELESCOPED—A roll that has lost its integrity by having the plies extending beyond the top or bottom of the roll creating an uneven surface.

TORN—A laceration on the side or end of a roll often affecting the wrapper or header.

WET/WATER—A roll that has been damaged by moisture.
Section 8 is designed to provide users with data supporting changes made to established “Best Practice Load Plans”.

As time goes on and the database of loading and receiving information is compiled, shippers, railroads, and members of the Quality Lead Team will analyze damage trend data developed from the database information.

Copies of these analyses will be placed into Section 8 for information purposes.

This publication includes samples of the origin and destination inspection reports designed to capture the information needed for the database.
Roll Paper Shipping Report

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<thead>
<tr>
<th>Vehicle Initial &amp; Number:</th>
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<tr>
<td>Receiver:</td>
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<td>Loading Date</td>
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</table>

<table>
<thead>
<tr>
<th>MO</th>
<th>DY</th>
<th>YR</th>
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Circle or Fill in the Blank - Background Information:

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<th>Securement Type/s:</th>
<th>Key Band</th>
<th>Dunnage Bags</th>
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<tr>
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Product Information:

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<tr>
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Load Securement:

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Doorway Protection:

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<td>Type of Key Unit Bands:</td>
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<tr>
<td>B End Void (inches)</td>
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<td></td>
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</table>

Photos Taken? | Yes | or | No |

Loaded By: | Phone # |  |

4/15/11
Vehicle Initial & Number:

Shipper: City/State/Province

Receiver: 

Unload Date: MO DY YR

Car Doors:
- Door OK: Yes or No
- Door Bulged: Yes or No
- Door Holes: Yes or No
- Door Leaking: Yes or No

Load Securement Condition:
- Condition of Bands: Broken Fallen Loose OK
- Filler Condition: Crushed Moved OK
- Doorway Protection Condition: Broken Fallen Other OK
- Riser Condition: Crushed Displaced OK

Condition of Bags;
- R/S Bag Void (inches): OK
- L/S Bag Void (inches): Burst
- C Bag Void (inches): Flat
- A End void: Moved

A End void (inches)
B End void (inches)

**Damaged Roll Information**

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<thead>
<tr>
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<th>Extent Damage (in inches)</th>
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<th>Damage Cause Code</th>
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<th>Where is Damaged on Roll?</th>
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<td></td>
<td></td>
<td></td>
<td>A end     B end</td>
<td>Doorway Right</td>
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<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>A end     B end</td>
<td>Doorway Right</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>A end     B end</td>
<td>Doorway Right</td>
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<td></td>
<td></td>
<td>A end     B end</td>
<td>Doorway Right</td>
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<td></td>
<td>A end     B end</td>
<td>Doorway Right</td>
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<td></td>
<td></td>
<td></td>
<td>A end     B end</td>
<td>Doorway Right</td>
</tr>
</tbody>
</table>

**Notes:**
- Damage Type Code: (01) Crushed/Out of Round; (02) Wet/Water; (03) Gouge; (04) Edge Crush; (05) Chafe; (06) Flat Spots; (07) Tear; (08) Contamination; (09) Package Damage; (10) Starting; (11) Telescoped; (12) Split Edge; (13) Cuts; (14) Concealed Damage; Special Note: Water Damage Should Be Reported Immediately To Delivering Carrier.
- Damage Cause Code: (A) Bracing Damage; (B) Doorway Protection; (C) Holes; (D) Load Shift; (E) Preload; (F) Unloading; (G) Protrusions; (H) Rough Surfaces; (I) Foreign Substances; (J) Securement Failure; (K) Loss of Roll Alignment; (L) Diameter Variance; (M) Roll Rotation

Photos Taken?: Yes or No

Representing: Phone #
SECTION 9

CIRCULAR NO. 42-K
(Supersedes Circular No. 42-J)

GENERAL RULES COVERING
LOADING OF CARLOAD SHIPMENTS
OF COMMODITIES IN CLOSED CARS

Issued November 1, 2010

The "General Rules" quoted in AAR Circular No. 42-J, dated January 1, 2001 have been revised as shown herein.

These "General Rules" MUST be observed for all closed car loading and take precedence over the "Loading Methods" referred to, or included, in the loading publications. Those publications contain detailed methods for loading specific commodities.

Approved by

DAMAGE PREVENTION AND FREIGHT CLAIM COMMITTEE
ASSOCIATION OF AMERICAN RAILROADS

Published by

Transportation Technology Center, Inc.
55500 D.O.T. Road
Pueblo, CO 81001

(Printed in U.S.A.)
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4/15/11
GENERAL RULES-CLOSED CARS

Copies of this Circular can be obtained from

Transportation Technology Center, Inc.
A subsidiary of the Association of American Railroads
55500 D.O.T. Road
Pueblo, CO 81001
CIRCULAR NO. 42-K

GENERAL RULES
COVERING LOADING OF CARLOAD
SHIPMENTS OF COMMODITIES
IN CLOSED CARS

The following Rules have been formulated for the purpose of providing SAFE methods of loading closed cars and MUST be observed. Primary purpose of these rules is safe transit of the rail car from origin to destination.

RULE 1. INSPECTION AND SELECTION OF CARS

(A) Cars must be inspected by carrier before placing for loading. Cars must also be inspected by shipper at loading point to see that they are in suitable condition to carry load safely to destination. Cars must have sound roofs, sides, floors and end walls, and operable, snug fitting doors.

(B) (1) Box cars for the loading of metals of heavy concentrated weight - for example; tin plate, copper anodes, lead ingots, cathodes, zinc slabs and spelters and all other high density commodities - must be inspected by the originating carrier (either before they are placed for loading or at loading point), to see that they are in suitable condition to safely carry loads to destination.

(2) When ordering box cars for loading concentrated weights of heavy commodities, shippers have the responsibility of notifying serving carriers of this purpose and of not loading any cars not inspected per Rule 1(B)(1).

(3) Railroads must inspect box cars furnished for loading of metals of heavy concentrated weight - for example; tin plate, copper anodes, lead ingots, cathodes, zinc slabs and spelters and all other high density commodities, to insure they meet one of the following requirements:

a. Car stenciled adjacent to door opening 25K or 50K which indicates floor loading capacity.
b. Have wood floor of 2-1/4 inch thickness in sound condition supported by at least three metal floor stringers on each side of center sill full length of car.
c. If equipped with sliding sill under frame, have wood floor of 2-1/4 inch thickness in sound condition supported by at least two metal floor stringers on each side of center sill full length of car.
d. If equipped with steel floors or special type wooden flooring full length of car provided, the overall strength of the floor is not less than that of a floor with three stringers as specified as in the foregoing.

If in doubt, obtain verification of the floor strength from the Mechanical Department of Car Owner.

Also, such floors and supporting structure must be in good condition when cars are loaded.

The shipper should check the box car to see that the floors and supporting structure are in good condition. If the shipper has any doubts concerning the condition of the car, the serving railroad should be contacted.
GENERAL RULES - CLOSED CARS

(4) Shippers have the responsibility of attaching a Concentrated Floor Loading card, Figure 1, to the routing or placard board on each side of box cars in which metals with densities exceeding 400 lbs. per cubic foot and/or exceeding 800 lbs. per square foot floor bearing area are loaded.

Figure 1
THIS CAR CONTAINS
CONCENTRATED FLOOR LOADING
HANDLE CAREFULLY

INSPECT CAREFULLY
CAR NUMBER STATION DATE

(5) Load, occupying less than total floor space, must be secured so as not to permit movement that would have an accumulative effect of overloading one end or one side of car when loaded in accordance with Rule 4(G).

RULE 2. CLEARANCE AT SIDE BEARING - LOADED CARS

For cars not equipped with constant-contact type side bearings (zero clearance normal) there must be clearance at side bearings to permit free curvature of trucks.

RULE 3. MAXIMUM LOAD WEIGHT

(A) The weight of load in the car must not exceed the load limit stenciled on the car.

(B) The weight of load on one truck must not exceed one-half of the load limit stenciled on the car.

RULE 4. DISTRIBUTION OF WEIGHT LENGTHWISE IN CARS

(A) For all box cars except staggered double-door cars built prior to 1966, the percentages of stenciled load limits, as shown below, must not be exceeded for loads located between truck centers, measured lengthwise of car, unless car owner has otherwise designated by note in the Official Railway Equipment Register.
GENERAL RULES - CLOSED CARS

Length of Load
10 ft. to 20 ft. .......................................................... 50%
20 ft. 1 inch to 24 ft. .................................................. 60%
24 ft. 1 inch to truck centers ....................................... 75%
Truck centers to full length of car ................................ 100%

(B) For staggered double-door box cars built prior to 1966, the percentages listed in Rule 4(A) will be as shown below:

<table>
<thead>
<tr>
<th>Length of Load</th>
<th>Inside Length of Car</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 ft. to 20 ft.</td>
<td>40 ft. 50 ft.</td>
</tr>
<tr>
<td>20 ft. 1 inch to 24 ft.</td>
<td>45% 40%</td>
</tr>
<tr>
<td>24 ft. 1 inch to truck centers</td>
<td>75% 75%</td>
</tr>
<tr>
<td>Truck centers to full length of car</td>
<td>100% 100%</td>
</tr>
</tbody>
</table>

Further, if the maximum load is 40% of stenciled load limit, the provisions of Rule 3(A) and (B) would not apply.

(C) Weight of material loaded in either end between truck centers and end of car must not exceed 15% of stenciled load limit for box cars built prior to January 1, 1966, and 25% for cars built subsequent January 1, 1966.

(D) When crosswise bearing pieces are used, the distance between the outside bearing pieces (center to center) must exceed the minimum distances specified in above Rules 4(A) and 4(B) for that percentage of the stenciled load limit being loaded and be in sufficient number to assure uniform distribution of lading on car floor.

(E) Bearing pieces lengthwise of car, extending beyond the lading may be used in order to spread weight distribution over a greater area. In such cases, "length of bearing pieces" is substituted for "length of load" in above Rules 4(A) and 4(B). Bearing pieces must be of suitable strength in relation to percentages stated and continuous and in sufficient number to assure uniform distribution of lading on car floor.
GENERAL RULES - CLOSED CARS

(F) When length of load is less than the distance between truck centers, and load is not located in center of car, the center of load weight must not be nearer to either truck center than shown below:

<table>
<thead>
<tr>
<th>Load Weight as % of Load Limit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>50% of load limit or less</td>
<td>Any place between truck centers.</td>
</tr>
<tr>
<td>60%</td>
<td>One-sixth distance between truck centers.</td>
</tr>
<tr>
<td>66.6%</td>
<td>One-fourth distance between truck centers.</td>
</tr>
<tr>
<td>75%</td>
<td>One-third distance between truck centers.</td>
</tr>
<tr>
<td>87%</td>
<td>Three-sevenths distance between truck centers.</td>
</tr>
<tr>
<td>90%</td>
<td>Nine-twentieths distance between truck centers.</td>
</tr>
</tbody>
</table>

(G) No lengthwise shift of lading is permissible unless load is secured as a floating unit under the following conditions:

1. All recommended securement and doorway protection methods are observed.

2. Retardation aids are used on all floating loads in closed cars where specified in individual loading pamphlets to prevent excessive shifting on car floor.

(H) When loading covered hopper cars all compartments are to be uniformly loaded to an equal height unless the car is listed in The Official Railway Equipment Register as being designed for unequal compartment loading. When loaded with high density material to gross rail load and less than 60 percent of available volume, car owner must be contacted for approval.

(I) Covered hopper cars, if subjected to stopover unloading, may have the compartments listed below partially or completely unloaded:

1. 2 compartment car - not permitted.
2. 3 compartment car - both end compartments or the center compartment.
3. 4 compartment car - both center or both end compartments.

Consignee must inspect car before releasing to ensure that remaining load is equally distributed and meets the provisions of Rule 5.

RULE 5. DISTRIBUTION OF WEIGHT - CROSSWISE OF CAR

(A) The load must be located so that the weight along both sides of car is about equal for the entire length of the load.

(B) When the load is of such a character that it cannot be placed so as to obtain equal distribution of weight, crosswise of car, suitable ballast, properly secured, must be used to equalize the weight.

(C) In box cars lading must be secured to prevent tipping or moving towards car's sides where the vacant space across car exceeds the following:

1. An aggregate of 18 inches crosswise of car.
GENERAL RULES - CLOSED CARS

(2) Vacant crosswise space of less than 18 inches as may be specified in pamphlets covering methods for loading, bracing and blocking carload shipments of individual commodities.

(D) Partial unloading of covered hopper cars crosswise of car or complete unloading of any compartment along one side, in cars with longitudinal partition sheets, is prohibited.

RULE 6. LOADING, BLOCKING AND BRACING - BOX CARS

(A) Lading must be loaded and secured so as to permit unloading from either side of rail car.

(B) All lumber used for blocking and bracing must be of sound material, free of defects which impair its strength or interfere with proper nailing.

(C) Machines and other items, having high center of gravity or narrow base, must be secured to prevent them from tipping over in transit.

(D) When car floor is not satisfactory for use of material handling equipment in loading and/or unloading operation, suitable steel plates or other adequate material must be placed in car to facilitate use of equipment and prevent equipment from breaking through door.

(E) The threads on rods or bolts used as bracing or blocking, or in connection therewith, must be chisel checked immediately behind single or double nuts to insure nuts remaining in original position. Two or more threads must extend beyond nuts. Not required when nut lock or lock nuts are used and properly seated and torqued to manufacturer's recommended minimum ft.-lb. value.

NOTE: Lock washers are not acceptable substitutes.

(F) All high-tension bands used for securing the load must meet the specifications published in ASTM Specification D3953 (latest edition).

(G) High-tension bands or wires securing the load must be machine tensioned and sealed or twist tied, respectively.

(H) Metal protectors, such as corner guards or plates, sufficient to provide a suitable radius must be used to protect bands and wires at all points on lading having sharp edges. Apply so as to prevent displacement.

(I) The manner of attaching metal ties to car walls must be in accordance with the methods prescribed for the individual commodities which reduces the possibility of anchor plates pulling loose or metal ties shearing.
GENERAL RULES - CLOSED CARS

(J) Where high-tension bands or high-tension wires are specified in the detailed rules, they may be substituted for each other, if of equal load strength, provided all the other items used to secure the load are equal in number and strength.

(K) Unless otherwise specified in the loading pamphlets, the number of bands or wire for rigid braced loads must have the combined joint strength in each longitudinal impact direction equal the weight of the lading being secured.

(L) The proper combination of steel bands or wire, seals and sealing tools must be used to provide the minimum joint strength for sizes listed in Tables 1 and 3.

(M) Non-metallic strap may be used for load securement only when specified in applicable commodity loading publications.

### TABLE 1
HIGH-TENSION BANDS

<table>
<thead>
<tr>
<th>Width &amp; Thickness Inches</th>
<th>Width &amp; Thickness Millimeters</th>
<th>Minimum Breaking Strength - Pounds</th>
<th>Minimum Joint Strength - Pounds</th>
<th>Recommended Minimum No. of Pairs of Notches on Joint - All Surface Finishes</th>
<th>Recommended Minimum No. of Pairs of Crimps on Joint</th>
<th>Surface Finish - Bands</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Uncoated, Dry</td>
<td>Coated, Not Waxed</td>
<td>Waxed</td>
</tr>
<tr>
<td>1% x .029</td>
<td>31.75 x .750</td>
<td>4,750</td>
<td>3,565</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>1% x .031</td>
<td>31.75 x .790</td>
<td>4,750</td>
<td>3,565</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>1% x .035</td>
<td>31.75 x .890</td>
<td>4,750</td>
<td>3,565</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>1% x .044</td>
<td>31.75 x 1.12</td>
<td>6,750</td>
<td>5,065</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>1% x .050</td>
<td>31.75 x 1.27</td>
<td>6,750</td>
<td>5,065</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>2 x .044</td>
<td>50.80 x 1.12</td>
<td>10,600</td>
<td>7,950</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>2 x .050</td>
<td>50.80 x 1.27</td>
<td>10,600</td>
<td>7,950</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>2 x .065</td>
<td>50.80 x 1.65</td>
<td>13,800</td>
<td>10,350</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

* Grit Seals Only. 6 Pairs Required for Non-grit Seals.

Note - A sufficient number of seals must be applied to accommodate the recommended number of pairs of notches or crimps.

The above recommended minimum number of notches or crimps is based on current general recommendations of high-tension banding manufacturers on the basis of tensioning and sealing tools being in proper operating condition. A lesser number of notches or crimps may be used provided the shipper can demonstrate that the joint has the minimum strength shown in the table under column "Minimum Joint Strength - Pounds".
GENERAL RULES - CLOSED CARS

In all cases, a sufficient number of notches or crimps must be used to achieve the minimum joint strength - pounds, as shown in the column headed "Minimum Joint Strength - Pounds".

Users of tensioning and sealing equipment should be properly instructed in the correct use of these tools and tools should be checked periodically to ensure their efficiency.

Following are illustrations of crimp and notch types of seal joints:

<table>
<thead>
<tr>
<th>CRIMP-TYPE JOINT</th>
<th>NOTCH-TYPE JOINT</th>
</tr>
</thead>
<tbody>
<tr>
<td>THREE PAIR SHOWN</td>
<td>TWO PAIR SHOWN</td>
</tr>
</tbody>
</table>

High-tension band sizes 1 1/4" and 2" used for load securements are to be marked to indicate manufacturer's or supplier's name and the letters "AAR".

Markings shall consist of the letters "AAR", the manufacturer's or distributor's name, or abbreviated name, or registered trademark, or symbol, or AAR code consisting of two digits. Markings shall be in characters not less than 1/8" high for steel die imprint and not less than 1/4" high for paint, ink surface printing or embossing, spaced at not more than 5 foot intervals.

Markings applied to high tension bands manufactured to metric dimensions must be followed by the letter "M" of the same size as the original marking.
GENERAL RULES - CLOSED CARS

The following methods of marking for purpose of identification have been assigned to manufacturers and suppliers whose products have been tested by the AAR and found to meet the requirements of this Rule.

<table>
<thead>
<tr>
<th>Name</th>
<th>Method of Marking</th>
<th>Markings</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITW/Acme Packaging</td>
<td>Steel Embossed</td>
<td>AAR 11</td>
</tr>
<tr>
<td>ITW/Signode</td>
<td>Steel Embossed</td>
<td>AAR 11</td>
</tr>
<tr>
<td>Samuel Strapping Systems</td>
<td>Steel Die Imprint, Ink Print</td>
<td>AAR 22,33,47</td>
</tr>
<tr>
<td>Gerrard-Ovalstrapping</td>
<td>Ink Print</td>
<td>AAR 52</td>
</tr>
<tr>
<td>Garibaldi (Chile)</td>
<td>Steel Die Imprint, Ink Print, Paint Embossed</td>
<td>AAR 20</td>
</tr>
<tr>
<td>Hankum Co, LTD.</td>
<td>Ink Print</td>
<td>AAR 57</td>
</tr>
<tr>
<td>Maillis Strapping Systems-USA</td>
<td>Ink Print</td>
<td>AAR 58</td>
</tr>
<tr>
<td>Dubose Strapping Inc.</td>
<td>Ink Print</td>
<td></td>
</tr>
</tbody>
</table>

**IMPORTANT** - High-tension bands must be applied to packages and/or loads with markings facing outward.

![TABLE 3](image_url)

**TABLE 3**
HIGH TENSION WIRE

<table>
<thead>
<tr>
<th>Gage</th>
<th>Diameter Inches</th>
<th>Minimum Joint Strength - Pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>.1620</td>
<td>1700</td>
</tr>
<tr>
<td>10</td>
<td>.1350</td>
<td>1700</td>
</tr>
<tr>
<td>11 1/2</td>
<td>.1130</td>
<td>1150</td>
</tr>
<tr>
<td>12</td>
<td>.1055</td>
<td>1080</td>
</tr>
</tbody>
</table>

(N) The following are the dimensions and breaking strengths of common annealed wire, rods and bolts:

![TABLE 4](image_url)

**TABLE 4**
COMMON ANNEALED WIRE

<table>
<thead>
<tr>
<th>Gage</th>
<th>Diameter Inches</th>
<th>Minimum Breaking Strength - Pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>.2500</td>
<td>2200</td>
</tr>
<tr>
<td>7</td>
<td>.1875</td>
<td>1100</td>
</tr>
<tr>
<td>8</td>
<td>.1719</td>
<td>950</td>
</tr>
<tr>
<td>9</td>
<td>.1562</td>
<td>800</td>
</tr>
<tr>
<td>11</td>
<td>.1250</td>
<td>500</td>
</tr>
</tbody>
</table>
GENERAL RULES-CLOSED CARS

TABLE 5
RODS AND BOLTS

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Minimum Breaking Strength - Pounds*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inches</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>5,200</td>
</tr>
<tr>
<td>5/8</td>
<td>8,100</td>
</tr>
<tr>
<td>3/4</td>
<td>11,700</td>
</tr>
<tr>
<td>7/8</td>
<td>16,200</td>
</tr>
<tr>
<td>1</td>
<td>21,100</td>
</tr>
<tr>
<td>1 1/8</td>
<td>25,800</td>
</tr>
<tr>
<td>1 1/4</td>
<td>32,800</td>
</tr>
<tr>
<td>1 3/8</td>
<td>38,600</td>
</tr>
<tr>
<td>1 1/2</td>
<td>46,900</td>
</tr>
</tbody>
</table>

* At Root of Thread

RULE 7. DOORWAY PROTECTION

When there is a possibility of lading falling or rolling out of doorway or coming in contact with sliding or plug type side doors, openings must be protected with wood doorway protection, steel straps or other material of sufficient strength and number and adequately secured. Cars equipped with plug type doors loaded with cylindrical items such as rolls of paper or drums require doorway protection unless specifically exempted by applicable commodity pamphlets.

RULE 8. CENTER OF GRAVITY

(A) Combined center of gravity of rail car and contents must not exceed 98 inches above top of rail. In closed cars there is no practical possibility of exceeding this center of gravity limitation except in cars which exceed Plate C dimensions.

(B) Cars exceeding Plate C dimensions may extend to 17 feet above top of rail. Certain ladings, such as rolled paper, when loaded two layers high may result in excessive combined center of gravity dimension. Shippers are to calculate the combined center of gravity of the rail car and contents whenever any part of the load will exceed 11 feet 8 inches (140") in height above the car floor. Shipper's tender of billing information for such cars to the origin carrier will signify compliance with this rule. Any questions on loading limitations in cars exceeding Plate C dimensions should be handled with the Mechanical Department of the origin carrier.
GENERAL RULES-CLOSED CARS

Use the following formula to calculate the combined center of gravity.

\[
A = \text{Height of car floor above top of rail in inches.} \\
B = \text{Empty center of gravity of rail car above top of rail in inches, obtainable from car owner.} \\
\text{ (Empty center of gravity may be stenciled on the rail car.)} \\
C = \text{Center of gravity of load above the car floor in inches.} \\
D = \text{Height of center of gravity of load above top of rail, equal to } A + C. \\
E = \text{Lightweight of rail car in pounds.} \\
F = \text{Weight of load in pounds.}
\]

Combined Center of Gravity (CG) = \[
\frac{(B \times E) + (D \times F)}{(E + F)}
\]

**NOTE:** The following table may be used as a guideline when determining \(A\) in the above formula:

<table>
<thead>
<tr>
<th>Weight of Load (Pounds)</th>
<th>Spring Deflection</th>
</tr>
</thead>
<tbody>
<tr>
<td>122,000 – 137,000</td>
<td>1.00 inches</td>
</tr>
<tr>
<td>138,000 – 164,000</td>
<td>1.25 inches</td>
</tr>
<tr>
<td>165,000 – 191,000</td>
<td>1.50 inches</td>
</tr>
<tr>
<td>192,000 – 207,000</td>
<td>1.75 inches</td>
</tr>
</tbody>
</table>

**EXAMPLE:** Roll Paper

Load: (a) 9 rolls or stacks of rolls @ 13,000 lbs each, 151" wide (tall)  
(b) 9 rolls or stacks of rolls @ 7,600 lbs each, 76" wide (tall)

**NOTE:** When the load consists of multiple sections or units having different unit heights and weights such as (a) and (b) above, each section or unit must be taken separately when calculating the CG of the load.

- \(A = 44"\)
- \(B = 58"\)
- \(C = (a) 151" / 2 = 75.5" \)  
  \(\text{(b) } 76" / 2 = 38"\)
- \(D = (a) 75.5" + 44" = 119.5" \)  
  \(\text{(b) } 38" + 44" = 82"\)
- \(E = 72,800\) lbs
- \(F = (a) 9 \times 13,000\) lbs \(= 117,000\) lbs  
  \(\text{(b) } 9 \times 7,600\) lbs \(= 68,400\) lbs

Combined CG \(= \frac{(B \times E) + [D (a) \times F (a)] + [D (b) \times F (b)]}{[E + F (a) + F (b)]}\)

\[
= \frac{(58 \times 72,800) + (119.5 \times 117,000) + (82 \times 68,400)}{(72,800 + 117,000 + 68,400)}
\]

\[
= \frac{4,222,400 + 13,981,500 + 5,608,800}{258,200 + 258,200}
\]

\[
= \frac{23,812,700}{258,200}
\]

\(= 92.23"\) above top of rail
GENERAL RULES - CLOSED CARS

RULE 9. SPECIAL EQUIPMENT

Load protection devices in specially equipped cars must be used in accordance with carrier instructions. Cross members or other equipped restraining devices must be left in car when empty and properly secured.

RULE 10. OPENING AND CLOSING OF DOORS

Mechanical trucks (forks lifts, etc.) must not be used to open or close freight car doors. If doors can not be opened, the serving railroad should be contacted for assistance.
RULE OF ORDER X

Procedures Governing Evaluation and Acceptance of New Closed Car Loading and Bracing Methods or Materials

Evaluation of Loading and Bracing Methods

The following procedures shall govern the evaluation and acceptance of new closed car loading and bracing methods or materials, not currently recognized in AAR publications.

Requests for Evaluation

Section 1. Requests for evaluation shall be in writing to the Director Damage Prevention and Loading Services and may originate with a shipper or supplier, the Chief Prevention Officer of the originating railroad, the Damage Prevention and Freight Claim Committee or any of its subcommittees, or one of the territorial Freight Claim and Damage Prevention Conferences.

Requests to Fully Define Proposal

Section 2. The written request shall fully define the proposed loading or bracing method or material, including an illustration; a statement of purpose; the approximate lading weight of proposed test shipments; description of the type of commodity to be shipped; type of rail equipment to be used; origin point; origin railroad; routes; and intermediate and destination carriers. Responding to the request, the Director Damage Prevention and Freight Claims shall make recommendations to all involved railroads.

If there is a need for Damage Prevention and Freight Claim Committee consideration, before further progression of the request, the Director Damage Prevention and Loading Services shall so advise the Chairman, Damage Prevention and Freight Claim Committee.

If Test Loads Are Recommended

Section 3. In the event of positive recommendation for test loads, the Director Damage Prevention and Loading Services shall notify the original railroad and the intermediate and delivering railroads that are expected to be actively involved in the majority of routes and seek their consent for the test loads.

Participation by DP&FC Committee

Section 4. If there is an appropriate Damage Prevention and Freight Claim Committee subcommittee, it shall be given opportunity to participate in the test.

Inspection Forms for Test Shipments

Section 5. Prior to commencing the test, the Director Damage Prevention and Freight Claims will supply the proponent with a numbered envelope for each test shipment. The envelope to contain standard inspection forms to be completed at origin and destination.
### Minimum Test Shipments and Reports

**Section 6.** Sufficient cars or trailers shall be shipped using the proposed method to ensure a minimum of twenty-five (25) reports. Dependent upon the proposal, it may be necessary to obtain comparison data on a minimum of twenty-five (25) cars or trailers, utilizing an approved shipping method. The twenty-five (25) reports must be complete in detail to permit an accurate evaluation of performance. Each of the twenty-five (25) reports to include both origin and destination inspections. The proponent will be responsible for obtaining fifteen (15) reports; the origin and destination carriers five (5) reports; and the Damage Prevention and Freight Claim Section, five (5) reports. The number of test shipments will be limited to those required to produce sufficient data to determine a valid conclusion.

### Uniform Preparation of Test Shipments

**Section 7.** The test shipments shall be prepared as uniformly as possible and be made in types of equipment normally utilized by the shipper.

### Shipper to Notify Origin Carrier

**Section 8.** The shipper is required to notify the origin carrier Chief Prevention Officer of test shipments, allowing enough lead time to permit the origin carrier to make an inspection and to notify delivering carriers so destination inspections can be arranged.

### Obligation of Origin Carrier Prevention Officer

**Section 9.** It shall be the obligation of the Chief Prevention Officer, origin railroad, to request outturns on a sufficient number of the test loads to provide a basis for proper evaluation of performance and to supply the Director Damage Prevention and Loading Services with copies of the requests.

### Observation at Destination

**Section 10.** The Director Damage Prevention and Loading Services shall arrange for staff observation at destinations of a sufficient number of test shipments to provide a base for engineering analysis.

### Alternative Test Procedures

**Section 11.** As an alternative to a portion or all of the foregoing test shipments, the Director Damage Prevention and Loading Services may request that proponent follow the "Procedures for Simulation Testing of New Closed Car Loading and Bracing Methods or Materials" as approved by the Damage Prevention and Freight Claim Committee.

### Synopsis of Test Reports

**Section 12.** When a test is concluded, the Director Damage Prevention and Loading Services shall prepare a synopsis of test reports for the Chairman, for Damage Prevention and Freight Claim Committee consideration by that Committee. The Damage Prevention and Freight Claim Committee shall approve, by a two-thirds vote of its members, or disapprove the proposal within a specified period of time.

### Proponent to be Furnished Copy of Synopsis

**Section 13.** Concurrently with the Director's submission of the synopsis to the Chairman, Damage Prevention and Freight Claim Committee, a copy shall be furnished the proponent.
DAMAGE PREVENTION AND LOADING SERVICES
REQUEST FOR TESTING

Date: ______________________

Proponent(s): ____________________________________________________________

Address(es): ______________________________________________________________

Phone No(s.): _____________________________________________________________

Name of Person Requesting Test: _____________________________________________

Title: _____________________________________________________________________

Commodity: __________________________________________________________________

Origin Location: ___________________________________________________________

Individual in Charge of Origin Loading: ______________________________________

Title: _____________________________________________________________________

Phone Number: ____________________________________________________________

Origin Railroad: ___________________________________________________________

Local Representative: ______________________________________________________

Phone Number: ____________________________________________________________

Proposed Destinations: _____________________________________________________

Intermediate and Destination Railroad: _______________________________________

Reason for Test: __________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Description of Loading and Bracing Method: (Attach diagram, list of materials and specification of proposed loading and bracing method.)

_________________________________________________________________________________________
_________________________________________________________________________________________
_________________________________________________________________________________________
_________________________________________________________________________________________
_________________________________________________________________________________________
_________________________________________________________________________________________
_________________________________________________________________________________________

Equipment to be Used: TOFC: _________________________________________________________
COFC: _________________________________________________________
Boxcar: _________________________________________________________
Type Draft Gear: _________________________________________________________
Car Size: _________________________________________________________
Other: _________________________________________________________
Describe: _________________________________________________________

Load Weight: _________________________________________________________

Proposed Starting Date (Allow 30 Days): _________________________________________________________

Note: As set forth in Rule of Order X in the Damage Prevention and Freight Claim Rule Book, we will need approximately 30 days from receipt of this form by Damage Prevention and Loading Services, and the start of the field test to request concurrence and cooperation of the involved carriers.)
SECTION 10

Damage Prevention
Product Vendor List

Revised November 1, 2010

Purpose:

This list is provided as a service to rail customers and member carriers. The Association of American Railroads does not endorse or guarantee the use or reliability of the products produced or distributed by the vendors listed herein.

The list is divided into two sections. The first contains an Alphabetical listing of vendors; the second is organized by Product Category. This list is not a complete list, and any vendors not shown have not been intentionally left out. Addresses shown are generally the company's headquarters office address. Each company may also have regional offices and/or regional contacts for product availability and distribution.

Submit Changes to: Mr. Gary L. Held, Director
Damage Prevention and Loading Services
AAR/TTCI
7001 Weston Parkway, Suite 200
Cary, NC 27513
(919)651-5027
Fax: (919)651-5405
email: gary.held@railinc.com
ALPHABETICAL LIST

United States

Allegheny Industrial Associates—An ITW Company
311 Plus Park Blvd., Suite #110
Nashville, Tennessee 37217
(800) 444-6337
(615) 399-9987
Fax: (615) 399-9982
Products:
  * Beverage Bulkheads
  * Contour Polyfoam Pads
  * D.I.D. Bags
  * Polyester Cord Strap
  * Rebonded Rubber Mats
  * Risers
  * Separators
  * Void Fillers

Acme Packaging Systems/ITW
13500 S. Perry Avenue
Riverdale, IL 60627-1182
(708) 849-2500
Fax: (708) 849-4945
Products:
  * Plastic Strap
  * Steel Strap

Amorim Industrial Solutions
26112 110th Street
Trevor, WI 53179
(800) 558-3206
Fax: (262) 862-2500
Products:
  * Rebonded Rubber Mats

Ancra International
4880 West Rosecrans Avenue
Hawthorne, California 90250
(310) 973-5000
Products:
  * Beam End Sockets
  * Cargo Restraining Devices
  * Corner Protectors
  * Custom Design Products
  * Shoring Beams
  * Strap Anchors
  * Strap Assemblies
  * Winches

BJK Industries, Inc.
P.O. Box 2949
Fort Smith, AR 72913
(501) 646-9300
Products:
  * Trailer Liners

Boomerang Packaging, Inc.
15344 Vantage Parkway E.
Houston, TX 77032
(281) 590-5163
(800) 214-2803
Fax: (281) 590-9755
Products:
  * Polyester Cord Strap

Caristrap International, Inc.
1760 Fortin Blvd.
Laval, Quebec Canada H7S 1N8
(450) 667-4700
(800) 361-9466
Fax: (450) 663-1520
Products:
  * Cargo Restraining Devices
  * Custom Design Products
  * Industrial Tapes
  * Non-wovens
  * Plastic Strap
  * Polyester Cord Strap
  * Strap Anchors

Centerload Shipping Technologies/ITW Shippers
3165 Diablo Avenue
Hayward, CA 94545
(800) 304-0031
Products:
  * D.I.D. Bags

Cordstrap USA
1101 South Sylvania
Sturtevant, WI 53177
(262) 898-6670
Fax: (262) 898-6677
Products:
  * Polyester Cord Strap

Circle Inc.
Specialized Paper Converting
911 Milwaukee Avenue
Burlington, WI 53105
(262) 539-4400
Fax: (262) 539-4409
Products:
  - Bulkheads
  - Contour Buffer Pads
  - Corner Protectors
  - Custom Designed Products
  - D.I.D. Bags
  - Risers Rubber Mats
  - Void Fillers

**Corrugated Systems, Inc.**
14700 Harvard
Dolton, Illinois 60419
(708) 849-0667
Products:
  - Bulkheads
  - D.I.D. Bags
  - Risers
  - Separators
  - Void Fillers

**Cougar Packaging Designers, Inc.**
800 Regency Drive
Glendale Heights, Illinois 60139
(630) 539-7361
Fax: (630) 539-7398
Products:
  - Cushion Contour Polyfoam Pads

**The Damage Prevention Company**
4120 Brighton Blvd.
Unit A-23
Denver, Colorado 80216
(303) 295-3003
Products:
  - Bulkheads
  - Coil/Roll Side & Edge Protectors
  - Contour Buffer Pads
  - Corner Protectors
  - Custom Design Products
  - D.I.D. Bags
  - Risers
  - Separators
  - Thermal Barriers
  - Void Fillers

**Dunnage Systems, Inc.**
P.O. Box 656
Sheridan, Arkansas 72510
(800) 288-4830
Fax: (888) 942-4710
Products:
  - Air Compressors
  - Bulk Containers
  - Bulkheads
  - Contour Buffer Pads
  - D.I.D. Bags
  - Risers
  - Separators
  - Slip Sheets
  - Void Fillers

**E. J. Brooks**
World Headquarters
8 Microlab Road
Livingston, NJ 07039
(800) 458-SEAL
(973) 597-2900
(973) 597-2919
Products:
  - Security Seals
  - Locking Devices

**Fleet Products & Equipment, L.L.C**
1920 Swift Avenue, Suite 202
N. Kansas City, Missouri 64116
(816) 221-1664
Products:
  - Bulk Containers
  - Cargo Restraint Devices
  - D.I.D. Bags
  - Separators
  - Slip Sheets
  - Stretch Wrap
Void Fillers

**Gerrard Ovalstrapping**  
Forest Products Division  
120-55th Street N.E.  
Fort Payne, AL 35967-8140  
(256) 845-1914  
Fax: (256) 845-1493  
Products:  
Polyester Cord Strap

**Greif, Inc.—now ITW Down River**  
701 West Scott Avenue  
Woodland, WA 68674  
(360) 225-9995  
Fax: (866) 675-2391  
Products:  
Buffer Material / Contour Buffer Pads  
Bulkheads  
Car Liner Sheets  
Corner Protectors  
D.I.D. Bags  
Drum Separators  
Honeycomb Panels  
Risers / Separator Pads  
Slip Sheets / Tier Sheets

**Holland Company**  
1000 Holland Dr  
Crete, IL 60417  
(708) 672-2300  
Products:  
Car components  
Cargo Sleds

**HEX-A-COMB**  
See Pregis

**Industrial Packaging Supplies**  
10 Jack Casey Court  
Fountain Inn, SC 29644  
(864) 862-1500  
(864) 862-1005  
Products:  
D.I.D. Bags  
Plastic Strap  
Steel Strap

**Interlake Packaging Corp.**  
1515 W. Mohawk Drive  
Tomahawk, WI 54487

(715) 453-2223  
Fax: (715) 453-7972  
Products:  
Void Fillers  
Corrugated

**International Dunnage LLC**  
3216 Center Street  
Thunderbolt, GA 31404 USA  
(912) 355-8884  
Fax: (912) 355-7234  
Products:  
D.I.D. Bags  
Straps and Buckles  
Inflator Tools

**Instrumented Sensor Technology**  
4704 Moore St.  
Okemos, MI 48864 USA  
(517) 349-8487  
Fax: (517) 349-8469  
Products:  
Shock and Vibration Recorders  
Accelerometers  
Temperature and Humidity Recorders Data Loggers  
Data Acquisition

**IRECO LLC**  
805 Golf Lane  
Bensenville, IL 60106  
(630) 741-0155  
Fax: (630) 595-0646  
Products:  
Lading Anchors

**ITW CargoSafe**  
1203 N. Main Street  
Mt Pleasant, TN 38474  
(931) 380-9428  
Products:  
Beam End Sockets  
Cargo Restraint Devices  
Corner Protectors  
Load Bars  
Shoring Beams  
Strap Anchors  
Strap Assemblies  
Track  
Winches
Ride Rite/ITW Shippers
300 South Edgar
Fordyce, AR 71742
(800) 468-1230
Products:
D.I.D. Bags

Kinedyne Corp.
3701 Greenway Circle
Lawrence, Kansas 66046-5442
(785) 841-4000
Fax: (785) 841-3668
Products:
Beam End Sockets
Cargo Restraint Devices
Corner Protectors
Custom Design Products
Shoring Beams
Strap Anchors
Strap Assemblies
Winches

Koneta Rubber Company
Matting Division
1400 Lunar Drive
Wapakoneta, Ohio 43895
(419) 739-4200
Products:
Rubber Mats

Lansmont Corporation
Ryan Ranch Research Park
17 Mandeville Court
Monterey, CA 93940 USA
(831) 655-6600
Products:
Data Loggers
Temperature Recorders
Humidity Recorders
Vibration Measurement Tools
Test Instruments

Lat-Lon
2300 South Jason Street
Denver, CO 80223
(877) 300-6566
(303) 937-7406
Fax: (303) 531-5754
Products:
Data Recorders

Logistick
19880 State Line Road
South Bend, IN 46637-1545
(800) 758-5840
(574) 271-2565
Fax: (574) 271-2574
Products:
Blocking and Bracing Devices
Strapping
D.I.D. Bags
Void Fillers
Security Seals
Corner Protectors

Lock ‘n’ Pop
20508 56th Avenue, West
Lynwood, WA 98036
(800) 225-3009
Products:
Lock ‘n’ Pop

Lodge Lumber Company Inc.
5001 Oates Road
Houston, TX 77213
(713) 672-6679
Fax: (713) 672-5135
Products:
Separators

Maillis Strapping Systems
404 Wall Street
Fountain Inn, SC 29644-2035
(877) 962-4648
Products:
Polyester Strapping
Plastic Strapping
Strapping Tools

Menasha Packaging Company
1645 Bergstrom Road
Nenah, WI 54957
(920) 751-1000
Products:
Corrugated Boxes
Corrugated Fanfold
Bulk Containers

Moldwood Corp.
104 Mallard Circle
York, AL 36925
(205) 392-5257
Products:  
Core Plugs  

**National Rubber Technologies Corp.**  
1505 Hickory Hill Lane  
Brookfield, WI 53045  
(800) 785-3986  
(262) 785-7536  
Fax: (262) 785-7537  
Products:  
Custom Design Products  
Masticated Rubber  
Rubber Mats  

**Packaging Un-Limited Inc.**  
2215 Augustine Street  
Covington, KY 41014  
(859) 431-6194  
Fax: (859) 431-0808  
Products:  
Bulkheads  
Corrugated Pallets  
Custom Wood and Paper Products  
Edge Protectors  
Poly Foam pads  
Risers  
Roll Headers  
Separator Pads  
Void Fillers  

**Pasadena Slid and Pallet Co.**  
5202 Red Bluff Road  
Pasadena, TX 77508  
(281) 991-0190  
Fax: 281-991-0905  
Products:  
Eucalyptus Hardboard  
Skids and Pallets  
Corrugated Pallets  
Palletizing Materials  

**Pensacola Skid & Pallet**  
351 Becks Lake Road  
Cantonment, Florida 32533  
(850) 968-1504  
Fax: (850) 968-9393  
Products:  
Pre-assembled Bulkheads  

**PlasTech Inc.**  
70 S. Eaton Ct.  
Lakewood, Colorado 80226  
(800) 919-6919  
(303) 202-0852  
Fax: (303) 202-0454  
Products:  
Separators  
Slip Sheets  
D.I.D. Bags  
Void Fillers  

**PlyVeneer Products**  
800 48th Street  
Springfield, OR 97478  
(866) 447-0771  
(541) 747-0771  
Fax: (541) 747-0775  
Products:  
Ply Veneer Panels  

**Pregis Corp.**  
1650 Lake Cook Road, Ste. 400  
Deerfield, IL 60015  
(847) 597-2200  
(800) 834-9441  
Products:  
Void Fillers  
Die Cut Honeycomb  
Honeycomb Pallets  

**Prom Industries**  
13812 N.E. Clark Road  
Vancouver, WA 98685  
(360) 573-3611  
Fax: (360) 573-8110  

**RB Rubber Products**  
904 E. 10th Avenue  
McMinnville, OR 97128  
(503) 472-4691 / (800) 525-5530  
Fax: (503) 434-4455 / (800) 888-1183  

**RC Packaging Systems, Inc.**  
4935 Technical Drive  
Milford, MI 48381  
(248) 684-6363  
Fax: (248) 685-3521  
Products:  
Polyester Cord Strap  

**RFTrax—Now IONX**  
515 S. Franklin Street  
West Chester, PA 19382  

(484) 653-2600
Products:
Rail Asset Tracking
Data Acquisition Devices

**Shockwatch Corp.**
W. Mockingbird Lane
Dallas, TX 75247
(800) 527-9497
Fax: (214) 638-4512
Products:
Data Acquisition Monitors

**S-Line (now Ancra)**

**Safety Corporation of America -**
(Formerly: Vetter Systems, Inc.)
1005 International Drive
Oakdale, PA 15071
(412) 695-3100
Fax: (412) 695-3232
Products:
Rubber Lifting Bags

**Samuel Strapping Systems**
1455 James Parkway
Heath, OH 43056
(800) 222-1855
Fax: (614) 863-7330
Products:
Steel Strap
Plastic Strap

**ITW Shippers**
1203 N. Main Street
P.O. Box 69
Mt. Pleasant, Tennessee 38474
(615) 379-7731
(800) 933-7731
Fax: (615) 379-7735
Products:
Air Compressors
Angleboard
Bulk Containers
Coil/Roll Edge Protectors
Contour Buffer Pads
D.I.D. Bags
Load Bars
Roll Risers
Rubber Mats
Separators
Slip Sheets
Void Fillers

**Ship Tech International, Inc.**
385 Montana Drive

P.O. Box 492
Seely Lake, MT 59868
(800) 771-2196
(406) 677-2907
Fax: (406) 677-5021
Products:
Bulkheads
Contour Buffer Pads
D.I.D Bags
Polyester Cord Strapping
Rebonded Rubber Mats
Risers
Void Fillers

**Signode/ITW**
800 Corporate Woods Parkway
Vernon Hills, IL 60061
(800) 323-2464
Fax: (847) 913-9078
Products:
Load Cushioners
Plastic Strap
Polyester Cord Strapping
Steel Strapping
Strap Anchors

**Southern Bracing Systems, Inc.**
P.O. Box 761
Rome, GA 30161
(706) 291-4206
Fax: (706) 291-0229
Products:
Bulkheads
Cargo Restraining Devices
Contour Buffer Pads
Corner Protectors
Custom Design Products
D.I.D. Bags
Polyester Cord Strap
Risers
Rubber Mats
Separators
Laminated Bulkhead (Ty-gard™)
Void Fillers

**Southern Strapping Systems**
1900 Parish Drive
Rome, GA 30161
(800) 524-7513
Fax: (706) 291-0229
Products:
Polyester Strapping

**Sunrise Arkansas, Inc.**
400 Airline Drive
Benton, Arkansas 72015
(800) 264-5411
Fax: (501) 778-6335
Products:
- Bulkheads
- D.I.D. Bags
- Risers
- Separators
- Void Fillers

Sunrise Mfg., Inc
2665 Mercantile Drive
Rancho Cordova, CA 95742
(800) 748-6529
Fax: (916) 635-9730
Products:
- Buf-Bags
- Bulkheads
- D.I.D. Bags
- Laminated Bulkheads (Ty-gard™)
- Polyester Strap
- Rubber Matting
- Separators
- Slip Sheets
- V-Boards
- Void Fillers

Sunrise Washington, Inc.
5900-A N.E. 88th Street #119
Vancouver, WA 98665
(360) 574-3512
(888) 485-4085
FAX: (360) 574-7695
Products:
- Buf-Bags
- Bulkheads
- D.I.D. Bags
- Corner Protectors
- Void Fillers
- Laminated Bulkheads Ty-Gard 2000
- Corrugated Pallets
- Rubber Matting
- Polyester Strap
- Slip Sheets
- Stretch Film
- Roll Risers
- Security Seals

Syn-tex USA (now ITW/Shipper)

Tapex American Corporation
2626 20th Street
Port Huron, MI 48061-0233
(810) 987-4722
Fax: (810) 987-4728
Products:
- Polyester Cord Strap

TydenBrammall
409 Hoosier Drive
Angola, IN 46703
(800) 348-4777
Products:
- Security Seals

Ultimate Systems Ltd.
1430 N. Main St
Delphos, OH 45833
(419) 692-3005
Fax: (419) 692-1401
Products:
- Rubber Mats

SPC Solutions
500 South 59th Avenue West
Duluth, MN 55807
(800) 705-5279
(218) 624-8945
Fax: (218) 624-8949
Products:
- Angle board
- Beam and Sockets
UNSA America
5921 Thurston Ave.
Virginia Beach, VA 23455
(757) -552-0507
Fax: (757) 490-1548
Products:
   Bulk bags
   D.I.D. Bags

US Dunnage LLC
144 Wood Street
Crossett, AR 71635
(870) 304-2247
(866) 407-2247
Fax: (870) 364-2288
Products:
   D.I.D. Bags

Vin-Tex Sealers, Inc.
1447 W. Ardmore Avenue
Itasca, Illinois 60143
(800) 770-1920
Fax: (630) 773-3913
Products:
   D.I.D. Bags (Nylon Reinforced Urethane)

Walnut Industries Inc.
1356 Adams Road
Bensalem, Pennsylvania 19020
(800) 523-6536
(215) 638-7847 (in PA)
Fax: (215) 638-4939
Products:
   Laminated Bulkheads (Ty-gard™)
ALPHABETICAL LIST

Canada

Ancra Canada Ltd.
6710 Maritz Dr #2
Mississauga, Ontario
L5W 0A1 Canada
(866) 962-0055
Fax: (866) 792-0058
Products:
  Beam End Sockets
  Cargo Restraining Devices
  Corner Protectors
  Shoring Beams
  Strap Assemblies
  Strap Anchors
  Winches

Caristrap International, Inc.
1760 Fortin Boulevard
Laval, Quebec Canada H7S 1N8
(450) 667-4700
(800) 361 9466
Fax: (450) 663-1520
Products:
  Cargo Restraining Devices
  Custom Design Products
  Industrial Tapes
  Non Wovens
  Plastic Strap
  Polyester Cord Strap
  Strap Anchors

Cascades Enviropac Inc.
541, Melchers/P.O. Box 1620
Berthierville, Quebec Canada J0K 1A0
(450) 836-1799
(866) 836-1799
Fax: (450) 836-8235
Products:
  Honeycomb Products
  Polyester Cord Strap
  Rubber Mat

Converdis Inc.
601 rue Melchers
(450) 836-7026
Fax: (450) 836-3514
Products:
  Honeycomb Products

Complete Packaging Systems
1375 Hopkins Street
Whitby, Ontario, Canada L1N 2C2
(905) 668-4200
(866) 858-8800
Fax: (905) 666-6565
Products:
  D.I.D. Bags
  Friction Mats
  Polyester Cord Strapping
  PET Strapping Steel Strapping
  Seals and Buckles
  Edge Protectors
  Stretch Film
  Strapping Tools

Gerrard-Ovalstrapping
735 Oval Court
Burlington, ON, L7L 5L1
(905) 632-3662
Fax: (905) 639-2290
Products:
  Polyester Cord Strap

IRECO
Ronsco, Inc.
1440 St. Catherine St. W.
Suite 712
Montreal, Quebec H3G 1R8
(514) -866-1033
Fax: (514) -866-8421

Kinedyne Canada Limited
160 Dynamic Drive
Toronto, Ont. M1V 5A5
(416) 291-7168
Fax: (800) 663-7318
Products:
  Beam End Sockets
  Cargo Restraint Devices
  Corner Protectors
  Custom Design Products
  Shoring Beams
  Strap Anchors
Strap Assemblies
Winches

Maillis Strapping Systems
209 Wulftec Street
Ayer’s Cliff Quebec
Canada J0B 1C0
(877) 985-3832
Products:
Polyester Strapping

National Rubber Technologies Corp.
394 Symington Avenue
Toronto, Ontario M6N 2W3
(800) 387-8501
(416) 657-1111
Fax: (416) 652-4212
Products:
Custom Design Products
Masticated Rubber
Rubber Mats

Provincial Paper Products
6935 Davand Drive
Missisauga, Ontario L5T 1L5
(905) 670-7928
(866) 753-1532
Fax: (905)670-0531
Products:
Bulkheads
D.I.D. Bags
Industrial Tapes
Risers
Separators
Stretch Wrap Equipment and Films
Void Fillers

Samuel - Acme Strapping
743 Warden Avenue
Scarborough, Ontario M1L 4A9
(800) 607-8727
Products:
D.I.D. Bags
Plastic Strap
Steel Strap
Strap Anchors
Polyester Strap
Stretch Film
Seals and Buckles

Signode Canada
241 Gough Road
Markham, On L3R 5B3
(905) 479-9754
(800) 387-5173
Fax: 905-479-4869
Products:
D.I.D. Bags
Load Cushioners
Plastic Strapping
Steel Strapping
Strap Anchors

Syn-tex Convertors Ltd.
211 Hutchings Street
Winnipeg, Manitoba R2X 2R4
(204)632-5667
Fax: (204)633-4125
Products:
D.I.D. Bags (Woven Polypropylene)
Product Category List

*Canada

US and Canada

Air Compressors
Dunnage Systems Inc.
ITW Shippers

Angleboard
ITW Shippers

Beam End Sockets
*Ancra Canada Ltd.
Ancra International
ITW CargoSafe
*Kinedyne Canada Ltd.
Kinedyne Corp.
SPC Solutions

Beverage Bulkheads
Allegheny Industrial Associates—An ITW Company
SPC Solutions

Bulk Containers
Dunnage Systems Inc.
Fleet Products and Equipment, L.L.C.
ITW Shippers
SPC Solutions

Bulk Containment (Grain) Doors
Menasha Corp.

Bulk Liners
AsiaTek

Bulkheads
Circle, Inc.
Corrugated Systems, Inc.
The Damage Prevention Company
Dunnage Systems Inc.
Greif—Now ITW DownRiver
Packaging Un-Limited Inc.
Pregis
*Provincial Paper Prod.
Southern Bracing Systems, Inc.
SPC Solutions
Sunrise Arkansas, Inc.
Sunrise Mfg., Company
Sunrise Washington, Inc.

Bulkheads (Pre-assembled)
Pensacola Skid and Pallet

Car Liner Sheets
Menasha Corp.
SPC Solutions

Cargo Restraining Devices
*Ancra Canada Ltd.
Ancra International
#Caristrap International, Inc.
Fleet Products and Equipment, L.L.C.
ITW CargoSafe
*Kinedyne Canada, Ltd.
Kinedyne Corp.
Southern Bracing Systems, Inc.

Core Plugs
Moldwood Corp.
SPC Solutions

Corner Protectors
*Ancra Canada Ltd.
Ancra International
Circle, Inc.
The Damage Prevention Co.
ITW CargoSafe
*Kinedyne Canada, Ltd.
Kinedyne Corp.
Southern Bracing Systems, Inc.
SPC Solutions
Sunrise Mfg., Inc.
Sunrise Washington Inc.

Contour Buffer Pads
Circle Inc.
The Damage Prevention Co.
Dunnage Systems Inc.
Greif—Now ITW DownRiver
ITW Shippers
Southern Bracing Systems, Inc.
SPC Solutions

Cushion Contour Polyfoam Pads
Allegheny Industrial Associates—An ITW Company
Cougar Packaging Designers, Inc.
Packaging Un-Limited Inc.
SPC Solutions
Sunrise Washington Inc.

**Custom Design Products**
- *Ancra Canada Ltd.
- Ancra International
- #Caristrap International, Inc.
- Circle, Inc.
- The Damage Prevention Co.
- Damage Prevention Industries, Inc.
- *Kinedyne Canada, Ltd.
- Kinedyne Corp.
- #National Rubber Technologies Corp.
- Packaging Un-Limited Inc.
- Pregis
- Southern Bracing Systems, Inc.
- SPC Solutions
- Sunrise Mfg., Inc.
- Sunrise Washington Inc.

**Data Recorders**
- Instrumented Sensor Technology Inc.
- Lansmont
- Lat-Lon
- RFTrax—Now IONX
- Shockwatch

**D.I.D. Bags**
- Allegheny Industrial Associates—An ITW Company
- Centerload Shipping Technologies/ITW Shippers
- Circle Inc.
- Complete Packaging Systems
- Corrugated Systems, Inc.
- The Damage Prevention Co.
- Dunnage Systems Inc.
- Fleet Products and Equipment, L.L.C.
- Greif—Now ITW DownRiver
- Industrial Packaging Supplies
- Industrial Packaging Systems, Inc.
- Ride Rite/ITW Shippers
- International Dunnage
- Packaging Un-Limited Inc.
- *Provincial Paper Products
- ITW/Shippers Products
- Shipping Systems, Inc.
- *Signode Canada/ITW Canada
- Southern Bracing Systems, Inc.
- SPC Solutions
- Sunrise Arkansas, Inc.
- Sunrise Mfg., Company
- Sunrise Washington Inc.
- *Syn-tex Converters Ltd./ITW Canada

**US Dunnage**
- Vin-Tex Sealers, Inc.

**Doorway Protection Strips**
- Industrial Packaging Supplies

**Edge Protectors (Coils and Rolls)**
- Complete Packaging Systems
- The Damage Prevention Co.
- Packaging Un-Limited Inc.
- ITW Shippers
- Sunrise Mfg., Inc.
- Sunrise Washington Inc.

**Friction Panels/Mats**
- Greif—Now ITW DownRiver
- Key Tech Corporation

**Industrial Tapes**
- Allegheny Industrial Associates—An ITW Company
- #Caristrap International, Inc.
- *Provincial Paper Products

**Laminated Bulkheads**
- Southern Bracing Systems, Inc. (Ty-gard 2000)
- SPC Solutions (Ty-gard 2000)
- Sunrise Mfg., Inc. (Ty-gard 2000)
- Walnut Industries Inc. (Ty-gard 2000)

**Load Bars**
- ITW CargoSafe
- *Kinedyne Canada, Ltd.
- Kinedyne Corp.
- ITW Shippers
- SPC Solutions

**Load Cushioners**
- *Signode Canada, Inc./ITW Canada
- ITW/Signode

**Masticated Rubber**
- #National Rubber Technologies Corp.

**Non-Wovens**
- #Caristrap International, Inc.
- Carolina Strapping
- Complete Packaging Systems
- Cordstrap USA
- Maillis Strapping
- Tapex American Corp.
Southern Strapping
Sunrise Mfg., Inc.
Sunrise Washington Inc.

**Plastic Strap**
Acme Packaging Systems/ITW Shippers
Complete Packaging Systems
Industrial Packaging Supplies
Interlake Packaging Corp.
Maillis Strapping
*Samuel Strapping Systems
*Signode Canada Inc./ITW Canada
ITW/Signode Corp.

**Polyester Cord Strapping**
Allegheny Industrial Associates—An ITW Company
Boomerang Packaging, Inc.
#Caristrap International, Inc.
*Cascades Enviropac Inc.
Converdis Inc.
Cordstrap USA
*Gerrard-Ovalstrapping
Maillis Strapping
RC Packaging Systems, Inc.
ITW/Signode
Southern Strapping
Tapex American Corporation

**Rebonded Rubber Pads**
Allegheny Industrial Associates—An ITW Company
Circle, Inc.

**Risers**
Allegheny Industrial Associates—An ITW Company
Circle Inc.
Corrugated Systems, Inc.
The Damage Prevention Co.
Dunnage Systems Inc.
Greif—Now ITW DownRiver
Menasha Packaging Company
Packaging Un-Limited Inc.
*Provincial Paper Products
ITW Shippers
Southern Bracing Systems
SPC Solutions
Sunrise Arkansas, Inc.
Sunrise Mfg., Company
Sunrise Washington Inc.

**Rubber Mats**
Allegheny Industrial Associates—An ITW Company

**Amorim Industrial Solutions**
*Cascades Enviropac Inc.
Circle, Inc.
*Converdis Inc.
Koneta Rubber Company
#National Rubber Technologies Corp. (US and Canada)
Southern Bracing Systems, Inc.
ITW Shippers
SPC Solutions
Sunrise Mfg., Inc.
Sunrise Washington Inc.

**Security Seals**
Complete Packaging Systems
E. J. Brooks

**Separators**
Allegheny Industrial Associates—An ITW Company
Circle, Inc.
Complete Packaging Systems
Corrugated Systems, Inc.
The Damage Prevention Co.
Dunnage Systems Inc.
Fleet Products and Equipment, L.L.C.
Greif—Now ITW DownRiver
Lodge Lumber
Packaging Un-Limited Inc.
Pasadena Skid and Pallet, Inc.
*Provincial Paper Products
ITW Shippers
Southern Bracing Systems
SPC Solutions
Sunrise Arkansas, Inc.
Sunrise Mfg., Company
Sunrise Washington Inc.

**Shoring Beams**
*Ancra Canada Ltd.
Ancra International
ITW CargoSafe
*Kinedyne Canada Ltd.
Kinedyne Corp.
SPC Solutions

**Slip Sheets**
Circle, Inc.
Dunnage Systems Inc.
Fleet Products and Equipment, L.L.C.
ITW Shippers
SPC Solutions
Loading Roll Paper in Rail Cars

Steel Strapping
Acme Packaging Systems/ITW
Industrial Packaging Supplies
Samuel Strapping Systems
*Signode Canada Inc./ITW Canada
ITW/Signode
SPC Solutions

Strap Anchors
*Ancra Canada Ltd.
Ancra International
#Caristrap International, Inc.
IRECO
ITW CargoSafe
*Kinedyne Canada Ltd.
Kinedyne Corp.
*Signode Canada Inc.
ITW/Signode
SPC Solutions

Strap Assemblies
*Ancra Canada Ltd.
Ancra International
ITW CargoSafe
*Kinedyne Canada Ltd.
Kinedyne Corp.

Stretch Wrap Equipment and Film
Complete Packaging Systems
Fleet Products and Equipment, L.L.C.
*Provincial Paper Products
SPC Solutions
Sunrise Mfg., Inc.
Sunrise Washington Inc.

Thermal Barriers
The Damage Prevention Co.
SPC Solutions

Trailer Liners
AsiaTek
BJK Industries, Inc.

Void Fillers
Allegheny Industrial Associates—An ITW Company
Circle Inc.
Corrugated Systems, Inc.
The Damage Prevention Co.
Dunnage Systems Inc.
Fleet Products and Equipment, L.L.C.
Greif—Now ITW DownRiver

Industrial Packaging Supplies
Packaging Un-Limited Inc.
Pregis
*Provincial Paper Products
ITW Shippers
Southern Bracing Systems, Inc.
SPC Solutions
Sunrise Arkansas, Inc.
Sunrise Mfg., Inc.

Winches
*Ancra Canada Ltd.
Ancra International
ITW CargoSafe
*Kinedyne Canada, Ltd.
Kinedyne Corp.
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

PART I

A - INTRODUCTION

The "General Rules," contained in Circular No. 42-K, or Supplements thereto, issued by the Association of American Railroads, which are formulated for the purpose of providing safe methods of loading boxcars, must be observed.

This publication is intended to be a supplement to the Best Practices for Loading of Roll Paper in Rail Cars. It contains loading and bracing information and methods approved by the AAR but not included in the Best Practices publication. These methods and information were approved based on the requests of specific shippers or specific circumstances. While not considered “best practices,” they are acceptable for use in rail shipments when they fit the needs of shippers. The Best Practices for Loading of Roll Paper in Rail Cars should also be consulted for additional information on packaging, loading and securement.

If pulpboard rolls are neither wrapped, nor given end protection, the outer plies and top and bottom ends are regarded as protective packaging for the rolls. Therefore, chaffing, scuffing, or edge abrasion of the outer plies and ends is likely to occur when shipping this product using the applicable methods described in this publication.

These loading rules and/or practices apply to shipments transported in the USA, Canada and Mexico.

The loading methods, in individual closed car loading publications issued by the Damage Prevention and Loading Services, Association of American Railroads, are minimum standards that have been evaluated and approved. These minimum standards offer practical guidelines on the subjects covered. Since these are minimum standards, it may be necessary to supplement these methods in some instances.

Securement standards in AAR closed car loading publications are intended for safe transit of the rail car from origin to destination and prevention of lading and equipment damage. These standards do not address unloading practices.

Loading and bracing methods not presently approved may receive consideration for approval and publication under the "Damage Prevention and Loading Services Procedures Governing Evaluation and Acceptance of New Closed Car Loading and Bracing Methods and Materials." Submit requests to Director Damage Prevention and Loading Services, Association of American Railroads/TTCI, 7001 Weston Parkway, Suite 200, Cary, NC 27513.

CAUTION: Car rocking motion caused by lift equipment entering and/or exiting the rail car may cause unsupported packages or articles with a high center of gravity to fall to the floor. Minimize access to the car. Exercise caution when inside a partially loaded car. Lift operators should stay on lift equipment, whenever possible, while inside a partially loaded car.

B - SELECTION AND PREPARATION OF CAR

It is extremely important to ship roll paper in suitable equipment. Careful inspection and vehicle preparation are key elements to damage-free transportation of paper.

B-1
It is the railroad's responsibility to supply cars which are clean, have sound roofs, sides and square end walls, smooth floors and snug fitting doors. Any exception is cause for rejection. The shipper has the responsibility to inspect interiors of cars to see that they are suitable to carry lading safely and damage-free.
B-2
Before attempting to open the doors of any rail car, check to make sure that all hardware is intact so you can open the
door safely. Check the door tracks to make sure they are equipped with stops on the ends so the door doesn't fall off when
opening.

- It is very critical to check locking bars and related hardware to make sure you can safely open plug doors.
- Make sure the door is operating properly before fully opening the door. There is always the possibility that
  material or lading may be leaning against the car's doors or applying pressure.
- Use extreme care when opening any type of rail car door to protect against injury.

B-3
Always check the vehicle to see if there is a possibility of water entering into the vehicle. Water can easily enter a vehicle
with a result of product damage. Make sure that the car is water tight. Look for light leaks or evidence of new or large
amounts of rust which may indicate recent water entry into the vehicle.

(Note: It is extremely important that when a customer receives a rail car with any water damage, the carriers
involved are notified immediately to make sure the car is shipped and repaired before a repetition of the problem
occurs.)

B-4
Inspect the vehicle for any protrusions, rough, broken, or bent surfaces that could result in damage to product. It is
important that vehicles are clean and free from nails, brads, staples, temporary anchor plates, fragments of steel and
dunnage remnants. To prevent damage, cover projections of lining or anchor devices with protective materials taped in
place or otherwise adequately secured.

B-5
Check the end walls to make sure they are not bowed. If the end wall is severely bowed you should reject the car. If they
are bowed and you need to use the car, you will need to use materials of appropriate size and strength to bring the end
walls back to square. This will help to ensure that the load remains tight during its journey.

B-6
Check the car floors for any holes or rough surfaces that may result in leakage or damage to the product.

B-7
Inspect the car doors to make sure they close tightly and can be secured properly.

B-8
Any deficiencies listed above may be cause for rejecting the rail car back to the railroad. If the shipper elects to load cars
with these deficiencies, the shipper is then responsible for temporary repairs bringing the rail car to an acceptable level of
quality.

B-9
The loading methods illustrated in this book have a proven track record of success in specific car types. Please note the
type of car for which each method is used. Failure to use the proper loading method in the proper type of equipment will
result in damage to product and a dissatisfied customer. (i.e. - If a loading method is shown for use in a cushion equipped
car, use that loading method only in cushion equipped cars.)
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

C - DOORWAY PROTECTION

C-1
Doorway protection is required to prevent rolls from moving into and through the doorway during transit. Such roll movement can result in pressure on the door which is a safety concern during transit and unloading. The pressure can result in bulged door, doors being pushed open or dislodged from their tracks and/or doors which lose their weather seal protection.

C-2
When there is the possibility of lading falling or rolling out of doorway or coming in contact with sliding or plug type side doors, the opening must be protected with wood doorway protection, steel straps or other material of sufficient strength and number and adequately secured. See the Best Practices for Loading of Roll Paper in Rail Cars for general information on the use of steel or non-metallic strap as doorway protection. This publication contains supplemental information not found in the Best Practices Guide.

C-3
Cars equipped with plug doors loaded with roll paper/pulpboard require doorway protection unless specifically exempted by applicable commodity pamphlets. See the Best Practices for Loading of Roll Paper in Rail Cars for additional information.

C-4
Lumber may be used for doorway protection in roll pulpboard as shown in Illustration No. 1. The boards are applied flush with the inside of the doorposts and the inside face of the lumber is dressed. The boards are cut ¾” longer than the door opening and wedged between the doorposts. Use only when the doorway area is single layer.

C-5
Approved 1¼” wide polyester cord strap may be used as doorway protection in loads of 58” diameter roll pulpboard loaded in a 1-1 offset pattern and utilizing lumber, corrugated fiberboard risers or other approved void fillers to fill lengthwise void in the doorway. See Illustration No. 2 for proper installation of this method.

C-6
Rubber mats may be used as doorway protection in loads of 58” diameter roll pulpboard loaded in a single layer in a 1-1 offset pattern and utilizing full height longitudinal void fillers to fill lengthwise void in the doorway area. Do not use disposable inflatable dunnage (D.I.D.) bags for load securement with this method. See Illustration No. 3 for rubber mat specifications and proper installation of this method.

C-7
Roll cores may be used for doorway protection in 58” diameter roll pulpboard in cushion equipped sliding door cars, when rolls are loaded in a 1-1 offset pattern and the doorway area is single layer. See Illustration No. 4 for core specifications and installation instructions.

Illustration No. 1
Lumber Used for Doorway Protection in Roll Pulpboard Loads

Minimum 4”x4” or Laminated 2” x 4’ Material.
Use only when doorway area is single layer.
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Illustration No. 2

Doorway Protection with 58" Diameter Roll Pulpboard Loaded in a 1-1 Offset Pattern Using 1¼" Wide Approved Non-metallic Strapping*

This method of doorway protection is approved for use only in loads of 58" diameter roll pulpboard loaded in a 1-1 offset pattern and utilizing lumber, corrugated fiberboard risers or other approved void fillers to fill lengthwise void in the doorway area. Do not use disposable inflatable dunnage (D.I.D.) bags for load securement with these doorway protection methods.

1. Rolls are loaded in the ends of the boxcar in a 1-1 offset pattern. Use endwall or side wall blocking as specified in AAR approved loading methods.

2. Before loading doorway area, attach 1¼" wide non-metallic straps to the doorposts on the off loading side of the car. Use straps long enough to thread through the load and reach the diagonally opposite doorpost. Attach a short segment of the strap to the doorposts on the loading side of the car. Straps at the diagonally opposite doorposts are to be at the same height. The method of attachment to the doorpost anchor slots is shown below.

3. Load the doorway rolls on the off loading side of the car. The doorway straps go around the back of the rolls and pass between them as shown in the Sketch 2 on the following page. Lengthwise void fillers are positioned in the void between the rolls through which the straps pass. Void fillers are lumber, corrugated risers or other approved lengthwise void fillers used on the floor of the car. Full height void fillers are not to be used. Lengthwise void fillers may also be used at other locations.

4. Load the doorway rolls on the loading side of the car. The doorway straps pass between rolls and go in front of them in the doorway to the doorpost diagonally opposite from the post to which they are already attached. Again, lengthwise void fillers are positioned in the void between the rolls through which the straps pass. Lengthwise void fillers may also be used at other locations.

5. Attach the strap threaded through the load to the short strap segment using the proper buckle and tensioning tool. Sketch 3 on page 7 shows one type of buckle application.

* See the applicable AAR General Information Series publication for a listing of approved non-metallic strap and buckles for load securement.

Wrapping Non-metallic Strap on Doorpost Anchor. Use Three Wraps of Strapping Around Anchor as Shown

Illustration No. 2, Sketch 1
Strap Attachment to Doorpost
Illustration No. 2, Sketch 2

1¼" Wide Approved Non-metallic Strapping Used for Doorway Protection with 58" Diameter Roll Pulpboard Loaded in a 1-1 Offset Pattern
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Note: Tensioning Tool is Applied to the Pulling End in Step 7 to Complete Tensioning.

Illustration No. 2, Sketch 3
One Type of Buckle Application
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Illustration No. 3
Rubber Mats Used for Doorway Protection with 58" Diameter Roll Pulpboard and Similar Roll Paper Products Loaded in a Single Layer in a 1-1 Offset Pattern

This method of doorway protection is approved for use only in loads of 58" diameter roll pulpboard loaded in a single layer in a 1-1 offset pattern and utilizing full height longitudinal void fillers to fill lengthwise void in the doorway area. Do not use disposable inflatable dunnage (D.I.D.) bags for load securement with this doorway protection method.

It is important that rolls loaded using this method has consistent roll diameters.

Maintain good lengthwise row alignment throughout the load and particularly in the doorway area.

1. Rolls are loaded in the ends of the boxcar in a 1-1 offset pattern. Use endwall or side wall blocking as specified in AAR approved loading methods.

2. Rubber mats meeting the following specifications are positioned to cover the entire area under the doorway rolls as shown in Sketch 2. Do not overlap the doorway mats.

   Thickness: 3 mil (.125"
   Density: 69 lb/ft³ (Max)
   Tensile: ASTM D412: 250 psi Min. with grain (Die C)
            150 psi Min. across grain
   Elongation at Break: ASTM D412: 30% Min. with grain (Die C)
            60% Min. across grain
   Tear: ASTM D624: 60 PPI with grain (Die B)
            100 PPI across grain
   Hardness: ASTM D2240 Shore A: 50 ± 10
   Compression Set B: ASTM D395: 50% (22 hrs @ room temperature)
   Coefficient of Friction: TAPPI TB160M-92: 0.7

3. The outer edge of the mats is folded under a minimum of 2" and the doorway rolls are loaded on the mats. Remaining lengthwise void in the doorway area is filled using full height void fillers having crush strength of 2,250 lbs/ft². See below.

Illustration No. 3, Sketch 1
Void Filler
Crush Strength 2,250 lbs/ft²
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Illustration No. 3, Sketch 2
Rubber Mats Used for Doorway Protection with
58" Diameter Roll Pulpboard Loaded in a 1-1 Offset Pattern
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Illustration No. 4
Roll Cores Use for Doorway Protection in 58" Diameter Roll Pulpboard Loads
in a 1-1 Offset Pattern in Cushion Equipped Boxcars

This method of doorway protection is approved for use only in loads of 58" diameter roll pulpboard loaded in a 1-1 offset pattern with a single layer in the doorway area and utilizing lumber, corrugated fiberboard risers, roll cores or other approved void fillers to fill lengthwise void in the doorway area. Do not use disposable inflatable dunnage (D.I.D.) bags for load securement with these doorway protection methods.

Cores used for doorway protection are to have average crush strength of 4,800 lbs. when the load is applied over a 6" long segment of the core.

1. Rolls are loaded in the ends of the boxcar in a 1-1 offset pattern. Use endwall or side wall blocking as specified in AAR approved loading methods.

2. Lumber, corrugated risers, roll cores or other approved void fillers meeting published AAR requirements are used to fill lengthwise void in the doorway area.

3. Roll cores are used for doorway protection as shown in the illustration for this method. The cores are applied flush with the inside of the doorposts. The cores are cut ¼" longer than the door opening and wedged between the doorposts.
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Illustration No. 4
58" Diameter Roll Pulpboard Loaded in a 1-1 Offset Pattern with Roll Cores Used as Doorway Protection in Cushion Equipped Boxcars
**Supplemental Loading Standards**

**For**

**Roll Paper/Pulpboard in Closed Cars**

**D-GENERAL LOADING INFORMATION**

D-1
Corrugated fiberboard wedge blocks may be used in the doorway area to provide additional support for the dunnage bags, as shown in **Illustration No. 5**. The height of the wedge blocks is equal to the width of the D.I.D. bag(s). Void fillers and/or contour pads cannot be used in the doorway area adjacent the D.I.D. bag(s) when the wedge blocks are used in the doorway area. Void fillers and/or contour pads can be used at other locations, including the endwall if desired.

D-2
A roll omission method of loading roll paper may be used with loads in a 2-1-2 pattern as an alternative to an incomplete layer. See **Illustration No. 6**.

D-3
Use of a point roll at the endwall in 2-1-2 loading patterns is acceptable, in cushion equipped boxcars when required by the order size or to reduce lengthwise void. See **Illustration No. 7**.

---

**Illustration No. 5**

Corrugated Fiberboard Wedge Blocks
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Illustration No. 6
Roll Omission Method of Loading Roll Paper

1. Nominal 40" diameter rolls are shown in this load.

2. Load rolls from the endwall in a 2-1-2 Pattern. Continue placing rolls into the car until reaching location of first omitted roll. See Illustration No. 6, Sketch 2.

3. Place a single roll on two risers in this location. These risers are a minimum 6" x 5" x 30" corrugated fiberboard or equivalent material. If made of corrugated fiberboard, they are placed lengthwise in the car with the corrugations vertical. If they are made of other material, follow manufacturer’s instructions. Minimum crush strength of 9,000 lbs/ft² is required for risers.

5. Continue loading rolls two high until the location of second omitted roll, where again a single roll is placed on risers. Depending on the shipping order requirement, a third single roll can be placed in the location for the third omitted roll. The other end of car is loaded the same way. This allows up to 3 rolls to be omitted in each end of the car.

6. This method may also be used for single layer loads. The omitted rolls are located in the same position.

7. The remaining rolls are then loaded into the car placing them as tightly lengthwise as possible.

8. Use an approved securement method to secure the load. Illustration No. 6 shows the use of the appropriate level of D.I.D. bag for load weight and contour buffer pads.

Illustration No. 6, Sketch 1
Roll Omission Method of Loading Roll Paper
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Illustration No. 6, Sketch 2
Roll Omission Method of Loading Roll Paper

Illustration No. 7
Use of a Point Roll at the End Wall in Cushion Equipped Boxcars
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

PART II - LOADING METHODS

Method No. 1: 40"-42" Diameter Roll Paper with a Two Roll Key Inside an Eight Roll Unit in the Doorway Area

Method No. 2: 40" Diameter Roll Printing Paper Secured Using a Four Roll Unit, Rubber Mats and Disposable Inflatable Dunnage Bags in Cushion Equipped Boxcars

Method No. 3: 6 Roll Unit for 42" Diameter Newsprint in Cushion Equipped Boxcars

Method No. 4: 45" Diameter, 120" (3 Meter) Wide Roll Printing Paper Secured by Steel Straps in Cushion Equipped Boxcars

Method No. 5: 45" Diameter Roll Paper Loaded in a 1-2-2 . . . Pattern and Secured by a Single Horizontal D.I.D. Bag

Method No. 6: 45" Diameter Roll Paper with a Partial Second Layer On-Side in Cushion Equipped Boxcars

Method No. 7: 45" Diameter Roll Paper with a Partial Second Layer On-Side in Cushion Equipped Boxcars

Method No. 8: 50" Diameter Roll Paper Using 8 Ply D.I.D. Bags in Cushion Equipped Boxcars

Method No. 9: Four Roll Unit Using Approved Non-Metallic Strap* for 50" Diameter Newsprint in Cushion Equipped Boxcars

Method No. 10: 50"-56" Diameter Roll Pulpboard with an On-side Second Layer

Method No. 11: 58" Diameter Roll Pulpboard with an Incomplete Second Layer Loaded On End

Method No. 12: Use of Dual Bladder D.I.D. Bags in Loading Methods for 58"- 60" Diameter Roll Pulpboard, Carton Stock and Similar Large Diameter Paper Products

Method No. 13: 58" Diameter Roll Pulpboard with Corrugated Fiberboard Chocks Securing On-Side Second Layer in Cushion Equipped Boxcars

Method No. 14: 58" Diameter Roll Pulpboard with On-Side Second Layer Secured by Tall Blocking Rolls and D.I.D. Bags in Cushion Equipped Boxcars

Method No. 15: 58" Diameter Roll Pulpboard with Unitized On-Side Second Layer Rolls Secured by Blocking Rolls in Cushion Equipped Boxcars

Method No. 16: 58" Diameter Roll Pulpboard Loaded in a 1-1 Offset Pattern with Fiberboard Roll Cores Used for Side Wall Spacers and Void Fillers in Cushion Equipped Boxcars

Method No. 17: Inset Loading of the Door Area for 45" and 50" Diameter Roll Paper in Boxcars Equipped with Double Plug Door Cars

Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Method No. 1

40”- 42” Diameter Roll Paper with a Two Roll Key Inside as Eight Roll Unit in the Doorway Area Using 1¼” Wide Approved Non-Metallic Strap*

Use only cushion equipped boxcars for this loading method.

1. Load rolls on end tightly lengthwise of the car. Method No. 1 shows rolls loaded in the 2-1-2 pattern used for this method. Use bracing or void fillers between rolls in the ends of the car, if necessary, to eliminate any lengthwise void. The illustration for this method shows the use of D.I.D. bags and contour pads. The doorway loading pattern is to conform to that shown in the illustration.

2. Doorway key rolls are positioned as shown. Make sure the rolls in the doorway are loaded tightly against the adjacent rolls in both ends of the car. The key bands are not to be relied upon to pull the rolls in tight when tensioned. Do not load rolls in the doorsill area (sliding door cars).

3. Use two approved non-metallic straps (1-1/4” wide) for the 8 roll key and one strap for the 2 roll key if the doorway area is a single layer. Use one strap per layer for each key if the doorway is two or more layers. Seal strap using the proper buckle and tensioning tool. Illustration No. 2, sketch 3 on page 7 shows buckle application. Use strap protectors under the 2 roll key strap to allow tensioning of the strap and facilitate removal of tensioning tools.

4. Use strap hangers or tape to maintain proper strap alignment.

* See the applicable AAR General Information Series publication for a listing of approved non-metallic strap for load securement.

Note: An updated listing of verified D.I.D. bags can be found on the TTCI website: http://www.aar.com/dpls/pfds/PPPD_Verification_List.pdf
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Example Of D.I.D. Bags And Contour Buffer Pads Used To Eliminate Lengthwise Void.

8 Roll Key - Two Approved Non-metallic (1-1/4" wide) Straps.
2 Roll Key - One Approved Non-metallic (1-1/4" wide) Strap.
(Single Layer in Doorway)

40"- 42" Diameter Roll Paper with a Two Roll Key Inside an Eight Roll Unit in the Doorway Area
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Method No. 2

40" Diameter Roll Printing Paper Secured Using a Four Roll Unit, Rubber Mats
and Disposable Inflatable Dunnage Bags in Cushion Equipped Boxcars

This loading method constitutes load securement and doorway protection when the necessary disposable inflatable dunnage (D.I.D.) bags and void fillers are used in accordance with the procedures below.

Use only cushion equipped boxcars for this loading method.

1. Load rolls on end, tightly lengthwise of the car. Method No. 2 shows the pattern used for testing this method. Any AAR approved loading pattern may be used in the ends of the car.

2. Use void fillers between rolls in the ends of the car, if necessary, to reduce lengthwise void in doorway area to required size. Use of honeycomb void fillers and contour pads is shown. The doorway loading pattern is to conform to the pattern shown.

3. The last stack adjacent to each doorpost is two rolls wide, with rolls placed along the side walls.

4. Two 4' x 8' rubber mats are placed on the floor at one end of the doorway area crosswise of the car and centered. The rubber mats are rebonded rubber with the following specifications:

   Thickness: 3mm (0.125")
   Density: ASTM D-3676; 47 lbs/cubic ft.
   Tensile: ASTM D-412; 224 psi
   Elongation at Break; ASTM D-412: 152%
   Tear: ASTM D-624; 73 PPI (Die C)
   Compression Set B: ASTM D-395; 36 (25% Deflection, 158°F/22 hrs)
   Compression Set (Foam): ASTM D3676; 25 (50% Deflection, 158°F/22 hrs)
   Compression Properties: ASTM F-36; 100 psi - 19%, 400 psi - 52%
   Coefficient of Friction: ASTM D-1894; Wet: 0.766, Dry: 0.696

5. The next stack in each end of the car contains two rolls contacting each other with the point of contact along the longitudinal centerline of the car. One stack is on the rubber mats. (Also see Step 6.)

6. Place the last stack in the doorway area against the rolls in one end of the car and aligned along the longitudinal centerline of the car. This stack is also on the rubber mats. (Also see Step 7.)

7. If the doorway area is two or more layers, a rubber mat is positioned longitudinally between each layer of each row which is on rubber mats.

8. Unitize the rolls using approved non-metallic strap* (1 1/4" wide). Use one unitizing strap per layer. If the doorway load is a single layer with rolls exceeding 36" in width, use two unitizing straps. Seal strap using proper buckle and tensioning tool. Illustration No. 2, Sketch 3 on page 7 shows proper buckle application.

* See the applicable AAR General Information Series publication for a listing of approved non-metallic strap for load securement.
9. A Level 5 disposable inflatable dunnage bag (84" long) is placed horizontally in the void in the doorway area as shown. Use one bag per layer. Use the largest width bags which will fit the load without exceeding the height of the rolls. The bags may fill voids of 4" to 12". Position the bottom of the bag a minimum of 1" above the car floor. Inflate the D.I.D. bags to 8 psi. The maximum bag filled void, after inflation of the bags, is not to exceed 12".

10. Use an air gauge to insure proper air pressure at time of inflation. Recheck air pressure one half hour after inflation to check for possible leaks.

Note: An updated listing of verified D.I.D. bags can be found on the TTCI website: [http://www.aar.com/dpis/pdfs/PPPD_Verification_List.pdf](http://www.aar.com/dpis/pdfs/PPPD_Verification_List.pdf)

See Illustration No.2, Sketch 3 (page 7) for one type of buckle application information.

40" Diameter Roll Printing Paper Secured Using a Four Roll Unit, Rubber Mats and Disposable Inflatable Dunnage Bags in Cushion Equipped Boxcars
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Method No. 3

6 Roll Unit for 42" Diameter Newsprint in Cushion Equipped Boxcars

Use only cushion equipped boxcars for this loading method.

1. Load rolls on end tightly lengthwise of the car in a 2-1-2 pattern.

2. Doorway rolls are loaded as shown in the illustration of the method. The two rolls at the center of the six roll unit are loaded on the longitudinal center line of the car. Make sure the rolls; especially those on the off-loading side of the car are not in the doorsill area when loading sliding door cars.

3. Unitized the doorway unit using one 1¼" x 0.031" steel strap per layer. Seal the strap using the proper seals and four crimps per strap.

4. If the doorway area is a single layer and the width of the rolls exceeds 36", use two unitizing straps.

5. Use strap hangers or tape to maintain strap alignment.
6 Roll Unit for 42" Diameter Newsprint in Cushion Equipped Boxcars

Use One 1¼" x .031" Steel Strap Per Layer

13" - 15" Typically, Depending on Actual Roll Diameters and Car Dimensions
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Method No. 4

45" Diameter, 120" (3 Meter) Wide Roll Printing Paper Secured by Steel Straps in Cushion Equipped Boxcars

Use only cushion equipped boxcars with permanent wall anchors.

This loading method is intended for nominal 45" diameter by 120" wide roll printing paper. Rolls used in testing this method had steel cores.

1. Cover the load area of the boxcar floor with sheets of pulp or fiberboard. Line boxcar walls with fiberboard, if necessary to protect rolls.

2. Seven 1¼” x .031” steel anchor straps are installed on each side wall of each end of the car using one seal with two pairs of crimps at each anchor location. Install straps, as closely as possible, at the heights shown on the following page. Stagger anchor location as shown. Use wall anchor locations that are behind the last stack of rolls placed adjacent to the side walls.

3. Rolls are loaded in a 2-1-2 pattern as shown. Nine or ten rolls are loaded in each end of the boxcar.

4. When loading is completed in each end, secure each pair of straps in front of the load using proper seals and tensioning tools. Use fiberboard sheets between the steel straps and the rolls to reduce the potential for strap damage to the rolls. Four pairs of crimps are required for each joint. Tension the straps equally.
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

45" Diameter, 120" (3 Meter) Wide Roll Printing Paper
Secured by Steel Straps in Cushion Equipped Boxcars
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Method No. 5

45" Diameter Roll Paper Loaded in a 1-2-2 . . . Pattern and Secured by a Single Horizontal D.I.D. Bag
in Cushion Equipped Boxcars

This method was developed for loading of nominal 45" diameter, wide paper rolls in 50' high cube boxcars which have
load capacities suitable for this loading. The method can also be used for multiple layer loads.

Use only cushion equipped cars for this loading method.

1. Load rolls on end, tightly lengthwise of the car. The first roll at each end of the car is centered on the endwall. The
second stack contains two rolls loaded against the side walls. The third stack contains two rolls contacting each other
with the point of contact along the longitudinal centerline of the car. The pattern of the second and third stacks is
repeated, as shown in the illustration, until the last stack adjacent to the doorpost is reached.

2. The last stack adjacent to each doorpost is two rolls wide, with rolls placed along the side walls.

3. The next stack in each end of the car (in the doorway area) contains two rolls contacting each other with the point of
contact along the longitudinal centerline of the car.

4. Position four contour pads, one at each roll in the doorway area as shown. Use void fillers with crush strength of
2,250 lbs/ft², if necessary, to reduce lengthwise void in doorway area to required size. The illustration shows
honeycomb void fillers in the doorway area. Void fillers and contour pads may also be positioned at other locations,
including at the endwall to reduce lengthwise void. When void fillers are used at other locations in the car be sure the
last stacks in each end of the car, adjacent to the doorposts, are not beyond the doorposts into the doorway area.

5. A Level 5 disposable inflatable dunnage bag (96" long) is placed horizontally in the void in the doorway area as
shown in the illustration. Use the largest width bags which will fit the load without exceeding the height of the rolls.
The bag may fill voids of 4" to 12". Position the bottom of the bag a minimum of 1" above the car floor. Inflate the
D.I.D. bag to 8 psi. The maximum bag filled void, after inflation of the bags, is not to exceed 12".

6. Use an air gauge to insure proper air pressure at time of inflation. Recheck air pressure one half hour after inflation
to check for possible leaks.

Note: An updated listing of verified D.I.D. bags can be found on the TTCl website:
http://www.aar.com/dpls/pdfs/PPPD Verification List.pdf
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

45" Diameter Roll Paper Loaded in a 1-2-2... Pattern
and Secured by a Single Horizontal D.I.D. Bag
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Method No. 6

45" Diameter Roll Paper with a Partial Second Layer On-Side in Cushion Equipped Boxcars

Use only cushion equipped boxcars for this loading method.

1. Load rolls in two layers, tightly lengthwise of the car. The first layer consists of rolls on end in a 2-1-2 pattern. The second layer in the ends of the car consists of rolls on-side. Method No. 5 shows nominal 45" diameter rolls in the pattern used for testing this method.

2. The second layer on-side rolls are centered crosswise in the car. Small chocks made of wood or corrugated fiberboard are used under each roll to keep the roll secure during loading. Rubber mat or carpet underlayment (anti-skid) material 24" wide is placed crosswise to the car under each on-side roll. The second layer may consist of four rolls in each end of the car or four rolls in one end of the car and five rolls in other end.

3. The point rolls in the first layer immediately beyond the last second layer roll in each end of the car are loaded on corrugated fiberboard risers so they extend 12" above the floor layer rolls in the end of the car. A large chock block made by taping corrugated fiberboard risers together is installed between the blocking roll and the last roll in the second layer. This chock block should be at least 12" in height. Use a sufficient number of risers so that the chock fills the space between the blocking roll and the on-side rolls as shown. Bevel the face of the chock contacting the on-side rolls as shown.

4. Doorway rolls are positioned in a four roll unit as shown. Make sure the rolls in the doorway are loaded tightly against the adjacent rolls in both ends of the car. If doorway rolls are not tight against the adjacent point rolls or lengthwise void exists between the rolls in the four roll unit, place lengthwise void fillers between the point roll and the rolls in the ends of the cars to reduce the doorway area void. If the point roll is a blocking roll, the size of the chock may have to be adjusted accordingly. The unitizing straps are not to be relied upon to pull the rolls in tight when tensioned.

5. Use two – 1½" x .031" steel unitizing straps for the four roll doorway unit. Seal straps using proper seals and four crimps per strap.

Note: It is recommended shippers notify receivers that these loads contain a partial second layer with the rolls loaded on-side crosswise of the boxcar.
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

45" Diameter Roll Paper with a Partial Second Layer
On-Side in Cushion Equipped Boxcars
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Method No. 7

48” Diameter, Wide Roll Paper Secured by Horizontal D.I.D. Bags in Cushion Equipped Boxcars

The method shown was developed for loading of nominal 48” diameter, wide paper rolls, with weights up to 10,000 lbs., in 50’ high cube boxcars which have load capacities suitable for this loading.

Use only cushion equipped cars for this loading method.

1. Load rolls on end, tightly lengthwise of the car. The first roll at each end of the car is centered on the endwall. The second and third stacks contain two rolls loaded against the side walls. The fourth and fifth stacks contain a single roll centered in the car.

2. The sixth and last stack adjacent to each doorpost is two rolls wide, with rolls placed along the side walls.

3. The next stack in each end of the car (in the doorway area) contains two rolls contacting each other with the point of contact along the longitudinal centerline of the car.

4. Use void fillers with crush strength of 2,250 lbs/ft², if necessary, to reduce lengthwise void in doorway area to required size for application of disposable inflatable dunnage (D.I.D.) bags. The method shows honeycomb void fillers and contour pads in the doorway area. The void fillers and/or contour pads can be used at other locations, including the endwall if desired.

5. Place two Level 5 disposable inflatable dunnage bags horizontally in the void in the doorway area as shown in the illustration. Use the largest width bags which will fit the load without exceeding the height of the rolls. The bag may fill voids of 4” to 12”. Position the bottom of the bag a minimum of 1” above the car floor. Inflate the D.I.D. bag to 8 psi. The maximum bag filled void, after inflation of the bags, is not to exceed 12”.

6. Use an air gauge to insure proper air pressure at time of inflation. Recheck air pressure one half hour after inflation to check for possible leaks.

Note: An updated listing of verified D.I.D. bags can be found on the TTCI website: http://www.aar.com/dpls/pids/PPPD_Verification_List.pdf
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

48" Diameter, Wide Roll Paper Secured by Horizontal D.I.D. Bags
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Method No. 8

50" Diameter Roll Paper Using D.I.D. Bags in Cushion Equipped Boxcars

Use only cushion equipped cars for this loading method.

1. Nominal 50" diameter rolls are shown in this load. One, two or three layers may be loaded per shipping requirements. Partial layers are acceptable.

2. Use of this method is restricted to loading of the rolls in the pattern shown in the illustration. Location of rolls is to be followed to prevent damage to equipment.

3. On loads with incomplete second or third layer, use one unitization strap (1-1/4" x 0.031") approximately 6" from top of rolls in the incomplete layer. Steel strap, tape, wire or twine inserted into the cores or attached to core plugs are acceptable materials for strap holders used to maintain horizontal alignment of the unitization strap.

4. Risers are used in the fourth stack from each end wall on complete layer loads. Each of the four rolls is placed on two risers. Incomplete second or third layers are braced by placing two risers under each of the blocking rolls. These risers are a minimum of 6" x 5" x 40" corrugated fiberboard risers or equivalent material. Place risers lengthwise in the car with corrugations perpendicular to the floor. If they are made of other material, follow manufacturer’s instructions. Minimum crush strength of 9,000 lbs/ft² is required for risers. Risers of different designs may be used in lieu of those illustrated as long as their load carrying capacity is equal to the capacities specified for the units illustrated. Risers of alternate design are to be designed to prevent roll tipping and are to be a minimum of 6" in height.

5. Buffer pads are placed on each side of two doorway voids with the contoured side of pad facing rolls, flat side next to location of D.I.D. bag. These buffer pads are to be at least as high as the dunnage bags used. Minimum crush strength of 4,500 lbs/ft² is required for each buffer pad.

6. Use an appropriate level of disposable inflatable dunnage (D.I.D.) bag based on application and load weight vertically between buffer pads. Use bags 30" wide by appropriate length. These bags may fill voids from 4" to 12" and are not to exceed height of rolls when positioned 1" above car floor. The D.I.D. bag is inflated to 8 psi. The maximum void after inflation of the D.I.D. bag is not to exceed 12".

7. Use an air gauge to insure proper air pressure at time of inflation. Recheck air pressure one half hour after inflation to check for possible leaks.

8. Appropriate void fillers can be used to reduce lengthwise voids so that the dunnage bags will not fill more than 12" of void after inflation. This material is at least the same height as the buffer pad when used adjacent to D.I.D. bags. Minimum crush strength of 2,250 lbs/ft² is required for void fillers.

Note: An updated listing of verified D.I.D. bags can be found on the TTCI website: http://www.aar.com/dpls/pfds/PPPPD_Verification_List.pdf
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

50" Diameter Roll Paper Using D.I.D. Bags in Cushion Equipped Boxcars
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Method No. 9

Four Roll Unit Using Approved Non-Metallic Strap*
for 50" Diameter Newsprint in Cushion Equipped Boxcars

Use only cushion equipped boxcars for this loading method.

1. Load rolls on end tightly lengthwise of the car. Method No. 8 shows the loading pattern used in testing this method. The loading pattern is to conform to that shown. Use void fillers between rolls in the ends of the car to eliminate any lengthwise voids.

2. Doorway key rolls are positioned as shown. Make sure the rolls in the doorway are loaded tightly against the adjacent rolls in both ends of the car. The key bands are not to be relied upon to pull the rolls in tight when tensioned.

3. Use five approved non-metallic straps (1-1/4" wide), positioned as shown. If the load consists of more than two layers, space straps so at least one strap contacts each layer. Seal strap using proper buckle and tensioning tool. Illustration No. 2, Sketch 3 on Page 7 shows buckle application.

4. Use strap hangers or tape to maintain proper strap alignment.

* See the applicable AAR General Information Series publication for a listing of approved non-metallic strap for load securement.
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Four Roll Unit Using Approved Non-metallic Strap for 50" Diameter Newsprint in Cushion Equipped Boxcars

Use Five Approved Non-metallic (1 1/4" Wide) Straps

Strap Hangers
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Method No. 10

50”- 56” Diameter Roll Pulpboard with an On-side Second Layer

For all loads, follow these procedures without exception.

1. Chock on-side rolls only during loading and unloading operations for loader’s and unloaders personal safety.

2. Unitizing and key-roll straps to be 1-1/4” x .031” or equivalent steel, non/lubricated straps.

3. Two friction seals per closure with two crimps per seal.

4. Two unitizing straps per unit.

5. Use lumber pieces, 1” x 4”, as spacers for application of seals. Straps are to be attached to these 2” x 4” blocks by staples or other equivalent methods.

6. Blocking rolls to be a minimum of 8” taller than those rolls placed under on-side rolls.

7. In fifty-foot cars, units consist of a maximum of four rolls in each end of the car if 50” diameter pulpboard is loaded. When 56” diameter pulpboard is loaded, upper units are to consist of a maximum of four rolls in one end of the car and a maximum of three rolls in the other end.

8. In sixty-foot cars, units consist of a maximum of five rolls in each end of the car for either 50” or 56” diameter rolls of pulpboard.

9. Place rolls so that crosswise voids are approximately equal at both sides of the car.

10. One-two-one pattern is used in doorway to facilitate use of key-roll strapping. Use two straps for each two-roll key. Remaining rolls in the car are loaded in two-two-two pattern for placement of on-side rolls.
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Rolls Placed
Against End Wall
and Centered
Crosswise of Car

50"-56" Diameter Roll Pulpboard
with an On-side Second Layer
If pulpboard rolls are neither wrapped, nor given end protection, the outer plies and top and bottom ends are regarded as protective packaging for the rolls. Therefore, chafing, scuffing or edge abrasion of the outer plies and ends is likely to occur when shipping this product using this method.

1. Prior to loading, place side wall spacers in diagonally opposite corners of the boxcar. The spacers can be constructed from lumber (example shown), or manufactured void fillers (i.e. corrugated or honeycomb core type) with a crush strength of 2,250 lbs/ft². Spacers are a minimum of 4½” in depth, 40” in length and of sufficient height to extend at least 6” above the bottom of the adjacent second layer rolls.

2. The first roll in each end of the car is loaded at the endwall against the spacer. The remaining rolls are loaded in a 1-1 offset pattern.

3. The incomplete second layer rolls are secured by blocking rolls extending a minimum of 4” above the top of the first layer. Risers, 48” in length with crush strength of 9,000 lbs/ft², may be used under the rolls to provide adequate blocking height. Lumber (2” x 6”), corrugated fiberboard risers or equivalent material may be used as risers. Place risers lengthwise of the load as shown in the illustration. Risers of different design may be used in lieu of those illustrated as long as their load carrying capacity is equal to the capacities specified for the risers illustrated. Risers of alternate design are to be designed to prevent roll tipping.

4. The load may be secured using any bracing method approved by the AAR for 58” diameter rolls.
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

58" Diameter Roll Pulpboard with an Incomplete Second Layer Loaded On End
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Method No. 12

Use of Dual Bladder D.I.D. Bags in Loading Methods for 58”- 60” Diameter
Roll Pulpboard, Carton Stock and Similar Large Diameter Paper Products

Dual bladder disposable inflatable dunnage (D.I.D.) bags have been found to be acceptable for the securement of roll
pulpboard, carton stock and similar large diameter paper products.

1. The minimum void to be filled by the dual bladder dunnage bags, after inflation, is 12”. Use lengthwise void fillers
to reduce overall lengthwise void in the load, if necessary. Lengthwise void fillers are not to be positioned adjacent
to the dunnage bags, but may be positioned at other locations in the load. Use manufactured lengthwise void fillers
of sufficient size to extend to a minimum of 75% of the height of the adjacent rolls.

2. The dual bladder D.I.D. bags are positioned vertically, one in each row of rolls in the doorway area of the load as
shown below. Inflate the bags to 8 psi. Inflate both bladders in each dual bladder bag to the same pressure. Recheck
the dunnage bag pressures 30 minutes after inflation for possible leakage.

Lengthwise Void Filler
Crush Strength - 2,250 lbs/ft²
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Use of Dual Bladder D.I.D. Bags in Loading Methods for 58" - 60" Diameter Roll Pulpboard, Carton Stock and Similar Large Diameter Paper Products
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Method No. 13

58" Diameter Roll Pulpboard with Corrugated Fiberboard Chocks
Securing On-Side Second Layer in Cushion Equipped Boxcars

This loading method is for use with on-side second layer rolls of 58" diameter pulpboard, in lieu of second layer unitizing straps.

Use only cushion equipped boxcars for this loading method.

1. First layer rolls are loaded on end in a 1-1 offset pattern starting at diagonally opposite corners of the boxcar.

2. On-side second layer rolls in each end of the car are secured by chocks constructed from multiple layers of triple wall corrugated fiberboard glued together. Each sheet of triple wall has puncture strength of 1100 lbs. The chocks are 14" long at the bottom, 14" high at the back and 8.5" wide. The face of the chocks is contoured to fit the rolls. Each chock has double faced splicing tape on its face to attach the chock to the adjacent on-side roll.

3. Position a fiberboard chock at the endwall end of each second layer section. The chock is centered on the first layer roll at the endwall.

4. Load the on-side rolls against opposite side walls in each end of the car. The on-side rolls are placed against the same side wall as the first layer roll at the endwall in each end of the car. Use chocks with on-side rolls during loading operations for loaders’ personal safety.

5. Position a chock at the doorway end of each second layer section. The chock is centered on the first layer roll directly under the roll being chocked. This centers the chock at the doorway end on the apex of the blocking roll.

6. Blocking rolls are to extend the full height of the back of the chock (14"). Use risers if blocking rolls are not of sufficient width to provide the required blocking.

7. Place an appropriate level of disposable inflatable dunnage (D.I.D.) bag based on application and load weight, 48" wide x approximately the height of the roll, in the lengthwise void in each row, in the doorway. Inflate to 8 psi. Check air pressure in the dunnage bags ½ hour after inflation to determine if the bags have any leaks. Maximum void filled by a dunnage bag is not to exceed 12" after the bag is inflated.

Note: An updated listing of verified D.I.D. bags can be found on the TTCI website:
http://www.aar.com/dpls/pdfs/PPPD_Verification_List.pdf
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Chocks – Position One at Endwall and One at Doorway End of Second Layer

Appropriate Level D.I.D. Bags

Blocking Rolls

Double Faced Tape

Chock

58" Diameter Roll Pulpboard with Corrugated Fiberboard Chocks
Securing On-Side Second Layer in Cushion Equipped Boxcars
**Supplemental Loading Standards**

**For**

**Roll Paper/Pulpboard in Closed Cars**

**Method No. 14**

58" Diameter Roll Pulpboard with On-Side Second Layer

Secured by Tall Blocking Rolls and D.I.D. Bags in Cushion Equipped Boxcars

Use only cushion equipped cars when employing this loading method.

1. Place end blocking constructed of double 2" x 4" at opposite ends and sides of car. Completed units are 15-1/2" long and 24" wide.

2. Load a roll of pulpboard against each side wall and opposite end wall spacer. Continue placing rolls of pulpboard in a 1-1 offset.

3. Load the on-side rolls (three in one end and four in the other) in the center of the car with rolls in the first stack against endwall.

4. Chock on-side rolls during loading and unloading operations for loaders’ and unloaders’ personal safety.

5. Place a core section (36" diameter x 31" high x ½") on the floor, with a 58" diameter roll on top. This will act as block to prevent movement of second layer rolls. Continue loading remaining rolls.

6. Place an appropriate level of disposable inflatable dunnage (D.I.D.) bag based on application and load weight, (48" wide x approximate height of roll) in void between two on-floor rolls of pulpboard. Do not use in voids adjacent to raised rolls. Inflate to 8 psi. Check air pressure, ½ hour after inflation to determine if the D.I.D. bags have any leaks. One or two bags may be used per row as required as shown. Maximum void filled by a D.I.D. bag after inflation is not to exceed 12".

**Note:** An updated listing of verified D.I.D. bags can be found on the TTCI website: [http://www.aar.com/dpls/pfd/PPPD_Verification_List.pdf](http://www.aar.com/dpls/pfd/PPPD_Verification_List.pdf)

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**Sketch 1: Use of Taller Rolls as Blocking Rolls**
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Detail of Endwall Blocking Constructed of 2"x4" Lumber

Alternate Endwall Blocking

Appropriate Level of Disposable Inflatable Dunnage

Blocking Roll

36" x 31" Tall x ½" Core Section Used as a Riser

Cross Section of Rubber Chock

Sketch 2: Blocking Rolls on Risers

58" Diameter Roll Pulpboard with On-Side Second Layer Secured by Tall Blocking Rolls and D.I.D. Bags in Cushion Equipped Boxcars
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Method No. 15

58" Diameter Roll Pulpboard with Unitized On-Side Second Layer Rolls
Secured by Blocking Rolls in Cushion Equipped Boxcars

Use only cushion equipped cars when employing this loading method.

The following procedures have been tested and found successful for delivering rolls of pulpboard (58" diameter).

1. Place three 2" x 6" x 40" laminated lumber pieces on edge in opposite corners of car unless car is permanently equipped with spacers at the corners.

2. Load a roll of pulpboard against each laminated piece. Continue placing rolls of pulpboard in a 1-1 offset.

3. Load the on-side rolls (three each end, maximum 50' 6" boxcar, four each end, maximum 60' 6" boxcar) against the sidewall, where the corner spacers are placed.

4. Chock on-side rolls only during loading and unloading operations for loaders and unloaders personal safety.

5. Unitizing straps to be 1½" x .031" or equivalent steel, non-lubricated straps. Use two unitizing straps per unit.

6. Use two friction seals per strap with two crimps per seal.

7. Lumber pieces, 2" x 4", to be used as spacers under the unitizing straps for application of seals. Straps are to be attached to these 2" x 4" blocks by staples or other equivalent methods.

8. Blocking rolls to extend a minimum of 12" above those rolls placed under on-side rolls.

9. In the doorway, place lumber, 2" x 4" x 30" minimum, corrugated fiberboard risers or equivalent material on-edge between rolls in both doorways. These act as lengthwise void fillers.

Blocking Rolls Extend a Minimum of 12" Above Adjacent Rolls supporting on-Side Rolls
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

58" Diameter Roll Pulpboard with Unitized On-Side Second Layer Rolls
Secured by Blocking Rolls in Cushion Equipped Boxcars
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Method No. 16

58" Diameter Roll Pulpboard Loaded in a 1-1 Offset Pattern with Fiberboard Roll Cores Used for Side Wall Spacers and Void Fillers in Cushion Equipped Boxcars

This loading method uses roll paper cores as side wall spacers in the ends of the car and as lengthwise void fillers in the doorway area. Cores are to have average crush strength of 4,800 lbs when the load is applied over a 6" long segment of the core. The cores use in testing this method had 2½” inside diameter (ID) and ¾" wall thickness.

1. Prior to loading, place 48” long roll cores lengthwise on the floor against the side wall in diagonally opposite corners of the car as shown in the illustration for this method.

2. The first pulpboard roll in each endwall is loaded against these roll cores. The pulpboard rolls are loaded on end to the doorway area of the boxcar in a 1-1 offset pattern, with rolls maintaining centerline contact.

3. In the doorway area, load the rolls in a 1-1 offset pattern. Place one 48” long core as a void filler between two of the rolls on each side of the car as shown in Sketch 1. Void fillers may be used at two locations on each side of the car, if necessary, to take up all lengthwise void.
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

58" Diameter Roll Pulpboard Loaded in a 1-1 Offset Pattern with Fiberboard Roll Cores Used for Side Wall Spacers and Void Fillers in Cushion Equipped Boxcars
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Method No. 17

Inset Loading of the Doorway Area for 45” & 50” Diameter
Roll Paper in Boxcars Equipped with Double Plug Doors

Loading methods 17(A) and 17(B) are based on AAR approved concepts. They have been adapted for use in 50’ boxcars equipped with double plug doors. These methods are designed to eliminate contact between the rolls and the plug doors and, hence, reduce the likelihood of possible forces on the doors.

The preferred method for eliminating contact between the rolls and the plug doors is the inset doorway loading pattern. This pattern is illustrated in Method No. 17(A) for 45” diameter and in Method No. 17(B) for 50” diameter roll paper. The inset loading pattern with these roll diameters in a double door car requires the use of a “Figure-8” pattern or “X” pattern strap application adjacent to the dunnage bags. Illustration Nos.1 and 2 show the “X” pattern and “Figure-8” pattern strap applications.

The inset method is not practical for 40”- 42” diameter roll paper in double door cars because of the number of stacks in the doorway area. The only alternative for reducing contact with the doors is the use of sufficient key strap applications to protect all of the stacks in the doorway area. Use of straps across the doorway opening will not prevent the load from contacting the doors but would prevent rolls and/or dunnage bags from falling from the car when the doors are opened.

There is no inset doorway method for 58” diameter rolls. Use of rubber mats under all doorway rolls in a double door car is shown in Illustration No. 3 of this Method.
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Illustration No. 1
Four Roll ‘X’ Pattern

Illustration No. 2
‘Figure-8’ Pattern
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Method 17(A)
45” Diameter Roll Paper

1. Load rolls on end, tightly lengthwise of the car. Any AAR approved loading pattern may be used in the ends of the car.

2. Use void fillers with crush strength of 2,250 lbs/ft² in the ends of the car, if necessary, to reduce lengthwise void in doorway area to required size. The doorway loading pattern is to conform to Illustration No. 3.

3. The last stack adjacent to each doorpost is two rolls wide, with rolls placed along the side walls. At least half a bisection of these rolls must extend beyond the adjacent doorposts into each end of car.

4. The next stack in each end of the car contains two rolls contacting each other with the point of contact along the longitudinal centerline of the car. A void space of 1” is left when positioning the rolls to allow for insertion of the unitizing straps.

5. Place the last stack in each end of the doorway area adjacent to the previous stack and aligned along the longitudinal centerline of the car. Again, allow enough space between rolls to insert the unitizing straps.

6. Unitize the rolls in an ‘x’ or ‘figure-8’ pattern, as shown in Illustration No.’s. 1 & 2, using AAR approved 1¼” wide non-metallic strap. Use one unitizing strap per layer for each half of the ‘x’ (two straps per layer total) or one ‘figure-8’ strap per layer. If the doorway load is a single layer with rolls exceeding 36” in width use two ‘x’ pattern or ‘figure-8’ strap applications. Seal strap using proper buckle and tensioning tool, following manufacturer’s instructions. Use strap protectors under ‘x’ pattern straps to allow tensioning of the straps and facilitate removal of the tensioning tools.

Note: See the applicable AAR General Information Series publication for a listing of approved non-metallic strap for load securement.

7. A Level 5 disposable inflatable dunnage bag (96” long) is placed horizontally in the void in the doorway area as shown in Illustration No. 3. Use one bag per layer. Use the largest width bags which will fit the load without exceeding the height of the rolls. The bags may fill voids of 4” to 12”. Position the bottom of the bag a minimum of 1” above the car floor. Inflate the D.I.D. bags to 8 psi. The maximum bag filled void, after inflation of the bags, is not to exceed 12”.

8. Use an air gauge to insure proper air pressure at time of inflation. Recheck air pressure one half hour after inflation to check for possible leaks.

Alternate Method for Doorway Unitization - Can be Used in Place of ‘X’ or ‘Figure 8’ Strap Application

9. Two 4’ x 8’ rubber mats are placed on the floor of the doorway area crosswise of the car at the location of the inset doorway rolls on each side of the dunnage bag. See Sketch 2. The rubber mats are rebonded rubber with the following specifications:

- Thickness: 3mm (0.125")
- Tensile: ASTM D-412; 224 psi
- Tear: ASTM D-624; 73 PPI (Die C)
- Compression Set (Foam): ASTM D3676; 25 (50% Deflection, 158F/22 hrs)
- Compression Properties: ASTM F-36; 100 psi - 19%, 400 psi - 52%
- Coefficient of Friction: ASTM D-1894; Wet: 0.766, Dry: 0.696

10. If the doorway area is two or more layers, a rubber mat is positioned longitudinally between each layer of each row which is on rubber mats.

11. Unitize the rolls using approved non-metallic strap (1¼” wide). Use one unitizing strap per layer. If the doorway load is a single layer with rolls exceeding 36” in width, use two unitizing straps. Seal strap using proper buckle and tensioning tool.
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars


**50’6” Boxcar with 16’ Double Doors Shown**

„X” Pattern or „Figure-8” Pattern Strapping
Applications – See Illustration No’s 1 & 2

Note: Any AAR approved loading pattern may be used in the ends of the car

**Illustration No. 3**

45" Diameter Roll Paper Secured Using Horizontal D.I.D. Bags
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Method 17(B)
50" Diameter Roll Paper Secured Using Horizontal Disposable Inflatable Dunnage Bags

1. Load rolls on end, tightly lengthwise of the car. *Any AAR approved loading pattern may be used in the ends of the car.* The doorway loading pattern is to conform to that shown in Illustration No. 4.

2. Use void fillers with crush strength of 2,250 lbs/ft³ at the endwalls or between rolls in the ends of the car, if necessary, to reduce lengthwise void in doorway area to required size.

3. The last stack adjacent to each doorpost is two rolls wide, with rolls placed along the side walls. At least half a bisection of these rolls must extend beyond the adjacent doorposts into each end of car.

4. The next stack in each end of the car contains two rolls contacting each other with the point of contact along the longitudinal centerline of the car. A void space of 1" is left when positioning the rolls used in the 'x' or 'Figure-8' unitization pattern to allow for insertion of the unitizing straps.

5. Place the last stack in the doorway area against the rolls in one end of the car and aligned along the longitudinal centerline of the car. Again, allow enough space between rolls to insert the unitizing straps.

6. Unitize the rolls in an 'x' or 'Figure-8' pattern, as shown in Illustration No.'s. 1 & 2, using AAR approved 1¼" wide non-metallic strap. Use one unitizing strap per layer for each half of the 'x' (two straps per layer total) or one 'Figure-8' strap per layer. If the doorway load is a single layer with rolls exceeding 36" in width use two 'x' pattern or 'Figure-8' strap applications. Seal strap using proper buckle and tensioning tool, following manufacturer’s instructions. Use strap protectors under 'x' pattern straps to allow tensioning of straps and facilitate removal of tensioning tools.

**Note:** See the applicable AAR General Information Series publication for a listing of approved non-metallic strap for load securement.

7. A Level 5 disposable inflatable dunnage bag (minimum 102" long) is placed horizontally in the void in the doorway area as shown in Illustration No. 4. Use one bag per layer. Use the largest width bags which will fit the load without exceeding the height of the rolls. The bags may fill voids of 4" to 12". Position the bottom of the bag a minimum of 1" above the car floor. Inflate the D.I.D. bags to 8 psi. The maximum bag filled void, after inflation of the bags, is not to exceed 12".

8. Use an air gauge to insure proper air pressure at time of inflation. Recheck air pressure one half hour after inflation to check for possible leaks.

**Note:** An updated listing of verified D.I.D. bags can be found on the TTCI website:

Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

50’6” Boxcar with 16’ Double Doors Shown

4 Roll „X“ Pattern or „Figure-8“ Strapping Applications – See Illustration No’s 1 & 2

Note: Any AAR approved loading pattern may be used in the ends of the car.

Illustration No. 4

50” Diameter Roll Paper Secured Using Horizontal Disposable Inflatable Dunnage Bags
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Method No. 18

Securement of Partial Second Layers of Roll Printing Paper in Cushion
Equipped Boxcars Using 1½” Non-metallic Strap Anchored to Sidewalls

1. Use only cushion equipped cars when employing the loading method described herein.

2. Load and brace rolls in accordance with an AAR approved loading and bracing method.

3. The incomplete second layer will be braced by placing risers under each blocking roll. See Figure B for proper riser placement and riser specifications. If risers are made of corrugated fiberboard, have the corrugations vertical. If made of other material, follow manufacturer’s instructions. Risers of different designs may be used in lieu of those illustrated as long as their load carrying capacity is equal to the capacity specified for the riser shown. Risers of alternate design are to be designed to prevent roll tipping and are to be a minimum of 6” in height.

4. The incomplete layer is braced by ASTM Type IA Grade 5, 1½” bonded or woven polyester cord strapping approved by the AAR for load securement and having a minimum break strength of 5,400 lbs. and a minimum joint strength of 4,050 lbs. (75% of minimum break strength).

Note: See the applicable AAR General Information Series publication for a listing of approved non-metallic strap for load securement.

5. One anchor strap may be used for rolls of 40” width or less and two anchor straps for rolls greater than 40” width. Place the first strap at the center of the rolls and the second strap one-quarter of the height from the top of the rolls.

6. Attach the straps to permanent wall anchors located at least two stacks beyond the apex of the point rolls by looping the strap three times around the anchor point, pulling the inside of the strap out of the anchor while pulling the strap tight around the anchor, splitting this “inside end” and knotting it. The straps may also be secured by using the IRECO boxcar LTA Strap Retainer.

7. The straps are to be tensioned and joined using the correct buckle and tensioning tools in accordance with manufacturer’s instructions. It is important that the buckle be applied properly to maintain strap tension. Split and knot the strap on the tensioning side of the buckle after tensioning, when possible to insure against strap slippage.

8. Use strap hangers or tape to maintain proper strap tension.
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Approved Non-Metallic Strap Secured to Wall
Anchors Located at Least Two Stacks Beyond the
Apex of the Point Rolls

Use Strap Hangers or Tape

Risers, minimum 6” in height

Risers Placed Lengthwise in Car
Crush Strength:
- 6,000 lbs/ft² if a single layer placed in risers
- 9,000 lbs/ft² if 2 or more layers or heavy rolls placed on risers

Figure A

Figure B
Supplemental Loading Standards
For
Roll Paper/Pulpboard in Closed Cars

Closed Car/Trailer/Container Loading Pamphlets

1. Freight Forwarder (2/80)
4. Barrels, Drums or Kegs (11/65), Includes Special Supplement (6/74)
6. Building Brick in Closed Cars (8/83)
8. Plywood in Closed Cars (11/85)
14. Minimum Loading Standards for Freight (12/84)
15. Furniture (7/79)
17. Packaged Food Products (10/88)
20. Lumber in Closed Cars (10/87)
21. Machinery (5/95)
23. Steel Products in Closed Cars (4/95)
29. Household Appliance (10/79)
37. High Density Metallic Commodities (11/84)
39. Supplemental Loading Standards for Roll Paper/Pulpboard in Closed Cars (-/96)
Also see Best Practices for Loading of Roll Paper in Rail Cars for additional information.

41. Dictionary of Standard Terms (7/82)
42. Glass, Flat (6/94)

Intermodal Loading Guide (ILG) for Products in Closed Trailers and Containers (7/95)

Best Practices for Loading of Roll Paper in Rail Cars (4/11)
Also see Pamphlet No. 39, Supplemental Loading Standards for Roll Paper/Pulpboard in Closed Cars, for additional information.

Circulars

42-K General Rules Covering Loading of Carload Shipments of Commodities in Closed Cars (11/10)
43-C Rules Governing the Loading, Blocking and Bracing of Freight in Closed Trailers and Containers for TOFC/COFC Service (7/95)

General Information Bulletins (G.I.B.)

1. Handling and Shipping Fresh Fruits and Vegetables by Rail (5/76)
3. Instructions for Applying Polyethylene Sheets as Weather Protection in Boxcars (11/91)
4. Weather Protection for Open Top Wallboard Shipments (4/93)
5. Overloaded or Unbalanced Hopper Cars are Unsafe (8/93)
6. Measurement Requirements for Remote Ride Quality Monitoring (9/96)
7. Evaluating and Loading Auto Parts Racks in railcars for Transportation Via the North American Rail System (2/99)
8. Practical Guidelines for Stretch Film Roping of Steel Coils Shipped Eye Vertical in Boxcar and Intermodal Shipments (4/03)
9. Product Performance Profile for Pneumatic Dunnage (7/05)