Refrigerated Container Loading Suggestions
Disclaimer

Tiger Cool Express LLC ("TCE") is not responsible for any damages or injuries to persons or property caused by following these loading suggestions. These suggestions are general guidelines only and do not cover every possible loading situation. The shipper is solely responsible for the safe and proper loading of the container; inspecting the load before tender and release to TCE or its transportation provider; and any damages or injuries to persons or property arising from loading of the container.
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Overview

Tiger Cool Express provides an innovative, lower cost, more reliable and environmentally friendly intermodal alternative to long-haul trucking transportation. The company’s solutions overcome structural obstacles that have previously prevented temperature-controlled produce success.

The purpose of this guide is to offer suggestions for safely and legally loading cargo inside Tiger Cool Express refrigerated containers so that load failure and damage can be avoided.

General Loading Issues

Several entities are involved in the intermodal shipping of products. Each of these entities has their own requirements as follows:

Tiger Cool Express Requirements

Shipment must be pre-cooled to required shipping temperature.

Shipper Requirements

The person named in the bill of lading as the person from whom the goods have been received for shipment is the Shipper. General shipping requirements for Shippers are the following:

• The order and documentation should be ready at the time of the requested loading.
• The product should be properly packaged and staged.

Carrier Shipping Requirements

The Carrier is the person or company that transports goods for other persons or companies. General shipping requirements for Carriers are the following:

▪ Refrigeration unit is operating properly.
▪ Air chutes are properly installed and in good repair.
▪ Doors seal tightly when closed.
▪ Walls are free of cracks and holes.
▪ Floor drains are open.
▪ Inside of container is clean and odor free.
▪ Floor grooves are free of debris.
▪ Straps, gates or securement devices are available.
▪ Reefer unit is adequately fueled.

See Figure 1: Refrigerated Container Pre-load Inspection Checklist on next page.
Rules of Transportation for Tiger Cool Express LLC

- Shipments tendered under the Tiger Cool Express LLC’s Rules of Transportation are tendered as “Shipper Load and Count.”

- The Shipper is responsible for providing securement that will prevent side-to-side load shifting.
- The methods of securement provided by the shipper must meet Intermodal loading requirements.²

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Figure 1: Refrigerated Container Pre-load Inspection Checklist
Weight Issues Related to Loading

The Federal Bridge Gross Weight Formula (also known as Bridge Formula B and the Federal Bridge Formula) is a mathematical formula used in the United States by truck drivers and Department of Transportation (DOT) officials to determine the appropriate maximum gross weight for a commercial motor vehicle (CMV) based on axle number and spacing.

The formula is part of federal weight and size regulations regarding interstate commercial traffic (intrastate traffic is subject to state limits), and is necessary to prevent heavy vehicles from damaging roads and bridges.

CMVs are most often tractor-trailers or buses, but the formula is of most interest to truck drivers due to the heavy loads their vehicles often carry.

CMVs are required to pass through weigh stations at the borders of most states and some large cities. These weigh stations are run by state DOTs, and CMV weight and size enforcement is overseen by the Federal Highway Administration (FHWA). Weigh stations check each vehicle’s gross weight and axle weight using a set of in-ground truck scales, and are usually where a truck’s compliance with the formula is checked.

Federal Motor Carrier Safety Administration (FMCSA) regulations are based on the following formula:

\[
w = 500 \left( \frac{\ell n}{n - 1} + 12n + 36 \right)
\]

- \(w\) = the maximum weight in pounds that can be carried on a group of two or more axles to the nearest 500 pounds (230 kg).
- \(\ell\) = spacing in feet between the outer axles of any two or more consecutive axles.
- \(n\) = number of axles being considered.

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Air Circulation Issues Related to Loading

Air circulation is critical in maintaining product temperature during transit. Refrigeration capabilities are meaningless if the refrigerated air is not properly circulated to maintain product temperature.

For United States Department of Agriculture (USDA) guidelines, please refer to USDA website guide to transporting and protecting perishable foods.

General Air Circulation Issues

To address general air-circulation issues, follow these suggestions:

- Use an “airflow pattern.” Build air channels through and around sides of load to maximize air circulation
- Build a header or starter stack against the front bulkhead with vertical channels to facilitate air flow.
- Load top boxes in a solid layer to prevent air from short-circuiting back to the refrigeration unit.
- Allow at least 4 inches of space between the end of the load and the rear doors of the container for circulation.
- Do not load above the “Red Line” in the container. Loading above the “Red Line” can create stability issues, blocked air circulation, and freezing.

Air Circulation with Palletized Loads

When shipping palletized loads, follow these suggestions:

- To enhance cooling of palletized loads in containers with top-air delivery:
  - “Centerline load” to prevent heat conduction between the wall and product.
  - Allow space between wall and product for air flow.
- Load the pallets in rows with stringers running the length of the trailer.
- If pin wheeling pallets, use 4-way pallets to prevent blocking air flow.

![Figure 3: Longitudinal Container View](image-url)
Cargo Securement

Contract holders are responsible for ensuring their shippers properly secure loads for intermodal transportation. Here are some suggestions:

Stacking Product on Pallets

- Stack boxes squarely on pallets. Stabilize them to prevent shifting and/or toppling of cargo.
- Strap cargo both vertically and horizontally. Corner posts enhance securement to pallet. Net wraps and plastic shrink-wrap can be used. **CAUTION:** Do not use film wraps on products that are not properly pre-cooled and/or have high respiration rate. The film may block ventilation and cause heat buildup.

Tail Securement

- Carriers will provide a gate and a minimum of two (2) straps to the rear of the load.
- Secure the load with spacers, bracing, or air bags to prevent cartons from toppling and blocking air spaces between the walls and rows of pallets. *Please see photographs of rear-door bracing on next page.*
Figure 7: Example of Rear-Door Bracing (Photograph)

Figure 8: Example of Rear-Door Bracing (Photograph)
Appendix: Suggested Loading Configurations Based on Pallet Weight and Count

The loading diagrams provided in this document are intended to allow for proper weight distribution; however, *not all variables can be addressed in these diagrams, so care should be taken when loading.*

**Guide to Suggested Loading Configurations:**

Figure 9: Suggested Loading Configuration for Fifteen 40x48 Pallets, 2850#.......................... 8
Figure 10: Suggested Loading Configuration for Sixteen 40x48 Pallets, 2556# ....................... 9
Figure 11: Suggested Loading Configuration for Seventeen 40x48 Pallets, 2500# .................... 10
Figure 12: Suggested Loading Configuration for Eighteen 40x48 Pallets, 2361# .................... 11
Figure 13: Suggested Loading Configuration for Nineteen 40x48 Pallets, 2237# .................... 12
Figure 14: Suggested Loading Configuration for Twenty 40x48 Pallets, 2125# ..................... 13
Figure 15: Suggested Loading Configuration for Twenty-one 40x48 Pallets, 2024# ................. 14
Figure 16: Suggested Loading Configuration for Twenty-two 40x48 Pallets, 1932# ................. 15
Figure 17: Suggested Loading Configuration for Twenty-three 40x48 Pallets, 1848# ............... 16
Figure 18: Suggested Loading Configuration for Twenty-four 40x48 Pallets, 1771# ............... 17
Figure 19: Suggested Loading Configuration for Twenty-five 40x48 Pallets, 1700# ............... 18
Figure 9: Suggested Loading Configuration for Fifteen 40x48 Pallets, 2850#
Figure 10: Suggested Loading Configuration for Sixteen 40x48 Pallets, 2556#
Figure 11: Suggested Loading Configuration for Seventeen 40x48 Pallets, 2500#
Figure 12: Suggested Loading Configuration for Eighteen 40x48 Pallets, 2361#
Figure 13: Suggested Loading Configuration for Nineteen 40x48 Pallets, 2237#

It is the shipper's responsibility to verify axle weights prior to shipping. Variation in container, chassis, and tractor weight may make adjustments necessary.

For optimal airflow do not allow load to come in contact with the air chute.
**Figure 14:** Suggested Loading Configuration for Twenty 40x48 Pallets, 2125#

It is the shippers responsibility to verify axle weights prior to shipping. Variation in container, chassis, and tractor weight may make adjustments necessary.

For optimal airflow do not allow load to come in contact with the air chute.
Figure 15: Suggested Loading Configuration for Twenty-one 40x48 Pallets, 2024#
Figure 16: Suggested Loading Configuration for Twenty-two 40x48 Pallets, 1932#

It is the shipper's responsibility to verify axle weights prior to shipping. Variation in container, chassis, and tractor weight may make adjustments necessary.

For optimal airflow do not allow load to come in contact with the air chute.
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For optimal airflow do not allow load to come in contact with the air chute.

Figure 18: Suggested Loading Configuration for Twenty-four 40x48 Pallets, 1771#
Figure 19: Suggested Loading Configuration for Twenty-five 40x48 Pallets, 1700#
### Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carrier</td>
<td>The person or company that transports goods for other persons or companies.</td>
</tr>
<tr>
<td>CMV</td>
<td>Commercial motor vehicle.</td>
</tr>
<tr>
<td>DOT</td>
<td>Department of Transportation.</td>
</tr>
<tr>
<td>FHWA</td>
<td>Federal Highway Administration.</td>
</tr>
<tr>
<td>FMCSA</td>
<td>Federal Motor Carrier Safety Administration.</td>
</tr>
<tr>
<td>GAWR</td>
<td>Gross axle weight rating. The maximum distributed weight that may be supported by an axle of a road vehicle.</td>
</tr>
<tr>
<td>GVW</td>
<td>Gross Vehicle Weight. This is the total weight of the loaded vehicle, including the vehicle itself and the cargo.</td>
</tr>
<tr>
<td>GVWR</td>
<td>Gross Vehicle Weight Rating. This is the rating that is calculated by the manufacturer as the amount of weight that the vehicle will be when the vehicle itself is weighed filled with fuel and loaded according to the manufacturer’s specification.</td>
</tr>
<tr>
<td>Shipper</td>
<td>The person named in the bill of lading as the person from whom the goods have been received for shipment.</td>
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<tr>
<td>tare</td>
<td>The weight of an empty vehicle or container.</td>
</tr>
<tr>
<td>TCE</td>
<td>Tiger Cool Express LLC.</td>
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<tr>
<td>USDA</td>
<td>United States Department of Agriculture.</td>
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