



**What is the *National Motor Freight Classification*?**

The *National Motor Freight Classification (NMFC)* is a pricing tool used by shippers and motor carriers, which evaluates commodities based on their “transportability.” A product’s transportability, for classification purposes, is based on four transportation characteristics that are prescribed by the Department of Transportation’s Surface Transportation Board (STB). These characteristics are density, as measured in pounds per cubic foot; stowability, which includes such factors as loading restrictions due to excessive length or weight; ease of handling, including any special care or attention required to handle the freight; and liability, which provides a measure of the risks assumed by the carrier when transporting a product and includes the goods’ value per pound, susceptibility to theft, or propensity to spontaneous combustion or explosion and to damage other freight or be damaged by freight with which it is stowed. Classes are based on an evaluation of these four transportation characteristics of the freight, and are used by motor carriers in their pricing structures. The *Classification* specifies minimum packaging requirements that apply to each commodity to ensure the products can be handled and protected in the motor carrier environment.

The *NMFC* is distributed through the National Motor Freight Traffic Association (NMFTA), a trade association that represents less-than-truckload (LTL) motor carriers. The *NMFC* is developed and maintained by an autonomous standing committee of the NMFTA known as the National Classification Committee (NCC). In 1936, the Interstate Commerce Commission determined it was necessary for the motor carrier industry to use a freight classification, similar to the one the rail industry was already using. In response to this requirement, the motor carrier industry initially adopted the railroad’s classification. The *NMFC* is updated multiple times per year to reflect the ever-changing transportation characteristics of freight, establish new items for new commodities, update terminology to reflect current industry usage, cancel obsolete items, and maintain the packaging requirements. The *NMFC* may only be used by motor carriers who participate in the *Classification* and a list of these 1,100 carriers can be found in the book. Each

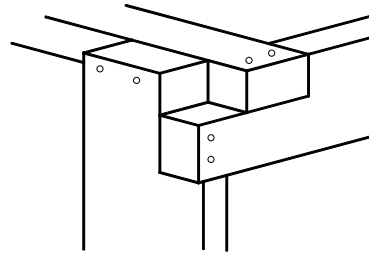
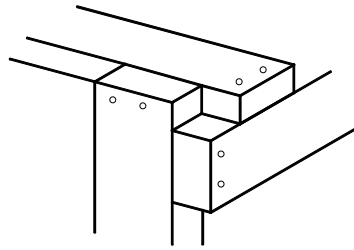
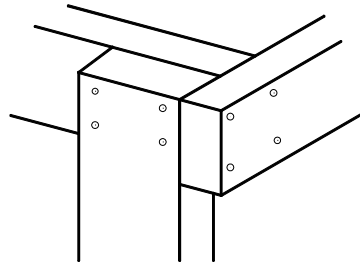
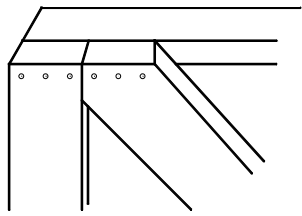
of these participating carriers pays an annual fee to utilize the provisions of the *NMFC* and may choose representatives to serve on the National Classification Committee.

There are four primary sections to the *Classification*: the Participating Carriers, the Rules, the Articles, and the Numbered Packages.

### *Rules*

The Rules section contains definitions of packaging containers and specifications of the materials used to construct those containers including fibreboard boxes, wooden crates, steel and aluminum drums, skids and lift-truck pallets, as well as additional information for using the *Classification*. One of the most commonly used rules is Item (Rule) 222 for fibreboard boxes. Item 222 contains specifications such as the maximum size and weight of a box for a given strength of board and the Box Manufacturer's Certificate, which is the standard used in the corrugated industry. While the board specifications were developed primarily for the less-than-truckload (LTL) industry, they have become one of the most important packaging standards. However, the information within Rule 222 may not be sufficient for other modes of transportation.

In addition to Rule 222, Item (Rule) 245 defines and specifies the construction requirements for crates. For many years, this rule has contained strict construction requirements. It provides that wooden crates must have three-way locking corners and the contents must be securely held within the crate. These requirements are necessary in order for the crate to be of sufficient strength for the LTL environment. Over the years, questions have been raised regarding exactly what constitutes a three-way locking corner and it was also noted that Rule 245 did not contain any specifications for wirebound crates. Wirebound crates are typically used for shipping light-weight products such as fruits or vegetables. However, a manufacturer of large equipment was using wirebound crates to ship their products, which weighed over 1,000 pounds and the packaging was not adequately protecting the product during transport, therefore damage occurred. Construction specifications of wirebound crates were designed for incorporation into Rule 245 and approved by a National Classification Committee Panel in late 2005. In addition to these specifications, drawings of proper three-way locking corners, as shown below, were added to the rule for clarification.



Besides the definitions and specifications provided for packaging containers and materials, the Rules section contains Items (Rules) 180 and 181, which are package performance test procedures that were designed specifically for use in the LTL industry. Rule 180 is a testing procedure for general shipping containers and Rule 181 is applicable to items listed under the Furniture Group and Furniture Parts Group, as named in the *MMFC*. Laboratory performance testing through Rules 180 and 181 has proven to be very beneficial over the last ten to fifteen years in simulating the LTL environment. Rule 180 was established in 1994 by a group of packaging professionals representing the packaging industry as well as the motor carrier industry. Throughout the last twelve years, minor changes have been made to this rule in order to clarify sections and incorporate necessary guidelines. Rule 181 was established in 2000 by members of the packaging and furniture industries, working with the motor carrier industry. However, Rule 180 has not been reviewed or updated since 2002 and Rule 181 has not been reviewed since its establishment.

In November of 2005, the NCC established a research project for these two rules and authorized the formation of an Ad-Hoc Committee to review and identify possible amendments to Rules 180 and 181 as deemed necessary to ensure they still reflect the LTL shipping environment. Also in 2005, the International Safe Transit Association (ISTA), with contribution

from NMFTA, developed a survey that was sent to members of the motor carrier industry to determine how the carriers relate packaging and handling of freight. This survey included questions regarding the types of equipment used for handling freight, what package specifications dictate the handling method including length, weight, and shape). The data collected from the survey, as well as comments and suggestions from the members of the Ad-Hoc Committee will serve as the basis for any possible changes that may be made to Rules 180 and 181. Thus far, some of the suggestions have included reformatting, updating the protocols, and increasing the severity, in order for it to simulate the LTL handling environment as closely as possible.

### *Numbered Packages*

The Numbered Packages section contains special packages that have been designed and tested for specific commodities. Each package is based on very specific material requirements and is only authorized for use on those products for which it has been successfully tested through laboratory or real world transportation testing. Over the years, over 2500 Numbered Packages have been designed for basic commodities, furniture, and bulk product shipping containers. However, most of these packages were developed over ten years ago, prior to the increased use of performance-based testing standards. Since performance-based packaged products are now more common, there have been very few Numbered Packages that have been established in recent years. The development of packaging specifications and the Numbered Packages has been primarily through Test Shipment Permits, which allow a shipper to send a package through the LTL environment and determine if the packaging will adequately protect the product(s) at their own risk. If damage does occur, the shipper shall not hold the carrier liable for damage due to insufficient packaging or the loading or bracing method.

### *Articles*

The Articles section lists products shipped in commerce today and are categorizes them by common traits. For example, the Furniture Group contains all types of furniture from chairs to tables to beds. This section not only contains individual commodity descriptions for use on bills of lading, but the packaging requirements and classes that apply. The packaging provisions may be as basic as loose (no packaging) or “in packages” which gives the shipper of the freight the

choice of how to package it. However, when the provisions allow for “in packages,” the packaging must be adequate to protect the product through the entire distribution environment. Only those articles that state “loose” or the relative few descriptions that do not specify any packaging requirements are allowed to ship with no packaging. Even then, it is common for shippers to attach their products to a lift-truck pallet in order to facilitate easier and safer handling. While most commodities in the *NMFC* name a specific form of packaging, they are most commonly required to be packaged “in boxes” that conform to Item (Rule) 222.

It is critical that shippers and manufacturers know the proper classification of their commodities, since each item in the *NMFC* has different packaging requirements. When the shipper properly applies the packaging provisions and specifications stated within the *Classification* and adequately protects fragile components, it is more likely to see a significant amount of damage reduction. In addition, the use of Rule 180 also ensures that the packaged products will be able to withstand the normal rigors of the LTL environment. However, if the commodities are found to not be in compliance with the packaging specifications set forth and damage occurs, a claim against the carrier is more likely to be rejected on the basis of insufficient packaging. If the packaging used is not specified, but protects the freight better than the packaging provisions of that product, Item (Rule) 685 may be applied, which allows for the alternation of packages. In order for Rule 685 to apply, the shipment packaging must afford the same or greater protection as the packaging provisions.

### **How is the less-than-truckload distribution environment unique?**

The LTL motor carrier distribution system has very unique characteristics that are inherent to how the systems function. Freight moving in the less-than-truckload environment is handled frequently, with multiple loading and unloading points during transit. During distribution, freight may be mixed with a wide variety of commodities, which impacts how and where in the trailer it is loaded. On the contrary, the truckload industry typically picks up freight from one location and delivers all of the freight to the same end location. Since the freight is picked up from a single manufacturer, the products may have similar transportation characteristics. Additionally, it is not handled as often as freight is in the LTL system, but truckload carriers may

also adhere to the minimum packaging requirements in the *NMFC*. The small parcel environment is only used for small, non-palletized freight, typically less than 150 pounds each. Tens of thousands of packages per hour are sorted through the small parcel environment and are subjected to various forms of compression, shock, and vibration. The packages are handled very often, typically using manual labor or mechanized methods, such as conveyor systems. Unlike the LTL industry, small parcel companies handle individual packages instead of unitized loads, which indicate that the packaging of the single package must be designed specifically for that handling system.

### **How are packaging provisions established in the *NMFC*?**

Packaging requirements in the *Classification* have been established through research, performance testing, real world shipment testing, and shipper or packaging industry proposals. When the *NMFC* was first published in 1936, some of the common forms of packaging were buckets, barrels, crates, bales, wooden boxes, and skids. Throughout the history of the *NMFC*, changes to commodities and packaging provisions have been made in order for the provisions to be accurate based on the freight moving in commerce and the latest forms of packaging. Many obsolete packaging forms have been removed from the *Classification* through research conducted at the request of the carrier members of the NCC, as well as proposals that have been received from shippers, manufacturers, packaging companies, and packaging professionals. Proposals may come from any interested party, except NCC/NMFTA staff, and should include appropriate data and information to support the request. Once all of the applicable information is received, a report is written for the NCC or one of its Classification Panels and is presented to the members at the next available meeting for their consideration. If the members determine the change is supported and warranted, they will approve the proposal, either as docketed or with modifications. Any modifications, however, must stay within the “scope” of the proposal.

### **What does it mean to be “in compliance”?**

Users of the *Classification* must be in compliance with the provisions shown therein. Throughout the last few years, shippers have been changing their packaging from corrugated boxes to film wrapped packages for large items such as appliances, water heaters, and filing

cabinets. While this packaging may provide the shippers with a cost savings on materials, they may not be in compliance with the packaging provisions of the *Classification*. There are only a few approved packages of this type that are permitted for use in the LTL industry, and those packages are only approved for the specific article in which they appear as an authorized package. Carriers have noticed an increase in damage due to the change from corrugated to film-wrap packaging and if the packaging is not in compliance with the *NMFC*, the carriers may decline any damage claims. Even though these film-wrap packages often include corner protectors and material to protect the top from freight that may be loaded on top of it, the film is not strong enough to prevent damage from occurring on the sides of the products.

### **What are research projects?**

Research projects are used to develop information on a product's transportation characteristics and packaging and may be established at the request of a member carrier, the NCC, a Classification Panel, or a shipper (on a direct-cost reimbursement basis). Research is conducted through mailings to associations and possible manufacturers that may represent or produce the products in question, as well as information developed by NMFTA member carriers, and firsthand by NCC/NMFTA staff via dock surveys. Once all of the necessary data is compiled, a report with the findings is brought forth for evaluation by the carrier members of the NCC. The report may include sample classification provisions and packaging specifications that are consistent with the NCC's established policies, guidelines and precedents. Current research projects include the packaging of copy machines, Rule 260 which defines and specifies the requirements of aluminum and steel drums, and the packaging of refrigerators or freezers and stoves or ranges.

### **Conclusion**

The *National Motor Freight Classification* is a valuable tool for shippers, manufacturers, carriers, and packaging professionals to utilize for determining the appropriate packaging requirements for nearly every commodity being transported in the less-than-truckload distribution system. Since the less-than-truckload environment is so unique compared to other distribution systems, it is critical for the users of the *Classification* to properly classify the commodities they

are shipping in order to identify the correct packaging provisions. The Rules and Numbered Packages sections allow *Classification* users to apply the specific construction requirements of the applicable packaging provisions. When the minimum packaging requirements are followed, the chances for a commodity to go through the LTL system without damage are improved greatly. In addition to following these minimum requirements, if manufacturers take advantage of having their packaged products tested and certified under Rules 180 or 181, they will be assured that their products will be able to withstand the normal hazards that occur during transport. The current research projects that are underway are critical to the improvement and accuracy of the *NMFC* and how it is applied to every industry. By utilizing the tools available in the *National Motor Freight Classification*, both shippers and carriers are able to know the appropriate classification and packaging that should be used for the less-than-truckload motor carrier system.

