

Supplier Packaging Guidelines



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Table of Contents

Supplier Packaging Guidelines	1
1.0 Introduction	4
1.1 Scope	4
1.2 Purpose	4
1.3 Quality Statement	4
1.4 Safety Statement	5
1.5 Sustainability Statement	5
2.0 Delivery Criteria & Supplier Responsibility	6
2.1 Supplied Quality	6
2.2 COC - Certificate of Compliance (Conformance)	6
2.3 Material Return Policy	6
3.0 Labeling & Documentation Standards	6
3.1 Overview	7
3.2 Part or Kit Label	8
3.3 Serial Number	9
3.4 Ship Label	10
3.5 Load Label	12
3.5.1 Master Load Label	13
3.5.2 Mixed Load Label	14
.....	15
3.6 New Revision Labels	17
4.0 TKE Packaging Materials & Form Factors	17
4.1 General Guidelines	17
4.2 PKG Decision Matrix / Delivery Quantity by Item Class & Velocity Code	18
4.3 Packaging Categories	22
4.3.1 Rigid and Flexible Plastic	23
4.3.2 Bulk Containers.....	25
4.3.3 Wood Packaging	27
4.3.4 Other	30
5.0 Testing	33
5.1 Pass/Fail Criteria	34
5.2 Test Reporting	34
5.3 Testing Guidelines and Reference Documents	34
6.0 Production Part Approval Process (PPAP)	34

6.1 PPAP Form Example..... 35

6.2 Supplier Change Request Document..... 35

6.3 Document Revision History and Approvals 38

7.0 Appendix..... 38

7.1 Terminology and Definitions..... 39

7.2 Test Report Example 45

7.3 Packaging Defect Examples 49

7.4 Label Placement Guide..... 51

7.5 Additional Icons List..... 54

1.0 Introduction

TKE's suppliers are an integral part of reaching the highest quality in the elevator industry. Reaching the highest quality requires a collective effort by both the supplier and TKE. This effort is what will drive the success of maintaining the highest of quality standards.

This guideline document outlines the components of TKE's supplier delivery standards. It details the expectations and requirements for all TKE suppliers.

TKE continues to strive for excellence. This sets the standard for providing a world class product that has world class performance. TKE wants their suppliers to work hand in hand and help them stay at the forefront of the elevator market.

1.1 Scope

The scope of this document is to outline the packaging guidelines for Made to Stock (MtS) and Made to Order (MtO) parts supplied to TKE. These guidelines are intended to inform suppliers about minimum packaging performance requirements and ensure delivered quality throughout the TKE supply chain.

1.2 Purpose

The packaging guidelines are intended to communicate best practices for suppliers to adhere to in order to supply damage-free parts all the way to the end user, optimize product efficiency, optimize packaging costs, and ensure safety through the TKE network.

The requirements laid out in this document represent an effort to ensure consistent, efficient, safe, and high-quality experience throughout distribution and onto end customers.

1.3 Quality Statement

At TK Elevator we are committed to:

- Passionately driving customer satisfaction and loyalty by partnering with customers and suppliers to help achieve their success.
- Deliver results with a sustained culture pertaining to quality, safety, and performance requirements of our products and services.
- Continually improving in all that we do.

We will accomplish this by building a strong foundation of quality, and committing to excellence across our entire value chain. By operationalizing quality and engaging everyone on our team, we will create an all-encompassing quality culture where our employees, suppliers, and customers feel the difference, ultimately creating a competitive advantage to TK Elevator.

1.4 Safety Statement

For TK Elevator, sustaining a healthy company means sustaining the health and safety of employees. Good health and safety performance, for us, is not random; it is the result of consequent and systematic action. Guidance for a systematic approach worldwide is provided by a health and safety handbook, an integral part of our corporate initiative - "zero accidents" - that comprises all worldwide actions regarding health and safety.

1.5 Sustainability Statement

At TK Elevator, sustainability means investing in innovative mobility solutions that tackle the challenges of urbanization while making cities and buildings smarter and the best places to live. It also involves reducing our company's operational footprint, increasing its social contribution, and ensuring its financial strength.

At TK Elevator, our commitment to reducing the environmental footprint of our products, processes, and operations is embedded in our culture and mindset. In fact, it lies at the heart of our sustainability approach.

Sustainability is embedded in the strategies, policies and business practices of TK Elevator - Americas. We strive to create a culture that fosters greener solutions for every aspect of our business, from daily operations to the materials we use in our products. By implementing the right actions today, we are making a better world for tomorrow.

1.5.1 Reducing our operational footprint

We're also making significant strides in driving down our operational footprint. At our sites, this means:

- Fewer CO2 emissions.
- Reduced water consumption.
- Increased energy efficiency.
- Improved waste management.

1.5.2 ISO 14001 implementation

The ISO 14001 Environmental Management System (EMS) standard guides our efforts. This international standard covers all relevant environmental aspects, from the reduction of wastewater, waste, and emissions to the environmental impact of products during use through to disposal. Our goal to implement ISO 14001 at all environmentally relevant manufacturing plants by fiscal year 2019/2020 has already been achieved. Today more than 90% of TKE manufacturing sites are certified to ISO 14001.

1.5.3 ISO 50001 implementation

We're using the ambitious ISO 50001 energy management standard to drive energy improvements. Our initial target to implement ISO 50001 for all energy-relevant activities, that is, stationary activities (excluding our fleet) with an annual energy consumption above 10 GWh, is already achieved. Today over 1/3 of TK Elevator manufacturing sites are certified to ISO 50001.

2.0 Delivery Criteria & Supplier Responsibility

This document does not constitute a manufacturing specification, nor does it suggest any responsibility by TKE for the performance of supplier packaging. The supplier is solely responsible for delivered quality.

The supplier shall notify buyer of any major changes to the QMS, ie. loss of registration, change of notified body or registrar, additional standards or unfavorable external audit performance changing registration status.

2.1 Supplied Quality

Maintain product quality through the use of suitable packaging materials. Suitable packaging materials have been defined for:

- Transport from or to the subcontractor.
- Internal transport/storage.
- Dispatch to customer.

Packaging specifications and corrosion protection for shipments to the customer have been agreed with the customer.

Related customer packaging specifications must be observed.

It must be ensured that the quality of the product is not impaired when it is packed, dispatched, put into storage and removed from storage.

2.2 COC - Certificate of Compliance (Conformance)

TK Elevator does not currently have any incoming materials, components or parts that require COC documentation.

2.3 Material Return Policy

The following process will be followed if nonconforming material is to be returned to a supplier.

If a part/item is rejected because of a supplier quality issue, the supplier will be notified via email from the appropriate Materials Manager (or other).

The supplier is required to supply a RMA number within 48 hours of receiving the notification of rejection.

If the RMA is not received within 48 hours, the shipment will be returned without a RMA attached.

It is the supplier's responsibility to call the Material Manager (MM) if they need more information concerning the rejection.

3.0 Labeling & Documentation Standards

3.1 Overview

One of the most important aspects of any inventory control system is proper material identification. To ensure proper regulatory compliance, TK Elevator Quality System has defined standards for Labeling.

Adherence to these labeling and documentation standards will reduce receiving errors, as well as prevent lost and misplaced production components. The impact of these problems are felt both internally and externally. With this in mind, the adherence to the standards is a key component of success for TKE and their suppliers.

To eliminate the confusion, and in turn the errors, we expect adherence to the following standards:

- Part/kit number
- Serial number
- Ship label
- Load label
 - Mater load label
 - Mixed load label

In reference to skid and box labeling, it is critical the standards for content and format be maintained. The TKE labelling format follows the widely used Automotive Industry Action Group (AIAG) label standard. Suppliers wanting additional information beyond the specifications provided in this document can obtain it going to web site www.AIAG.org.

Due to certain shapes and sizes, some commodities may require deviations to remain practical. Those items will be addressed on a case-by-case basis. The Supplier Quality Engineer (SQE) will have final approval regarding all deviations from these standards.

3.1.1 Barcode Specifications

Label Field	Human Readable Height	Data Identifier	Characters	Bold
Part Number	.4"	P	15	Yes
Revision	.4"	R	4	Yes
Quantity	.4"	Q	6	Yes
Purchase Order	.4"	K	6	Yes
Serial	.2"	S	25 Maximum	No
Date	.4"	1D	11	Yes
Description	.2"	Z	20	No
Additional Data	.2 Min.	1Z,2Z,3Z IF NEEDED	DETERMINED AS NEEDED	Yes/No AS NEEDED

3.2 Part or Kit Label

Each individual part or kit must bear a supplier generated label reflecting standard packaging information. For purchased complete finished goods, each item must bear one of the following labels.



3.2.1 Part Label Content

1. **Human readable part name:** Part of label that can be understood and interpreted by humans
2. **Barcode part number:** Eliminate the possibility of human error
3. **Human readable part number:** Part of label that can be understood and interpreted by humans
4. **Sequence number:** Human readable alphanumeric sequence
5. **Plant number:** location number of where the part was created
6. **Revision letter:** Current revision level of part

3.2.2 Part Label Specifications

1. **Label Dimension:** Dimensions will be determined by part size.
2. **Label Color:** White paper with black printing.
3. **Type Font:** Arial Type, all bolded except supplier name and part description, or, as otherwise noted
4. **Barcode Type:** Label both 3of9 and Code 128 are acceptable

Note:

A data identifier is a character that follows the start of the barcode symbol and is used to identify the information immediately following it. Bar code symbology to be PDF417.

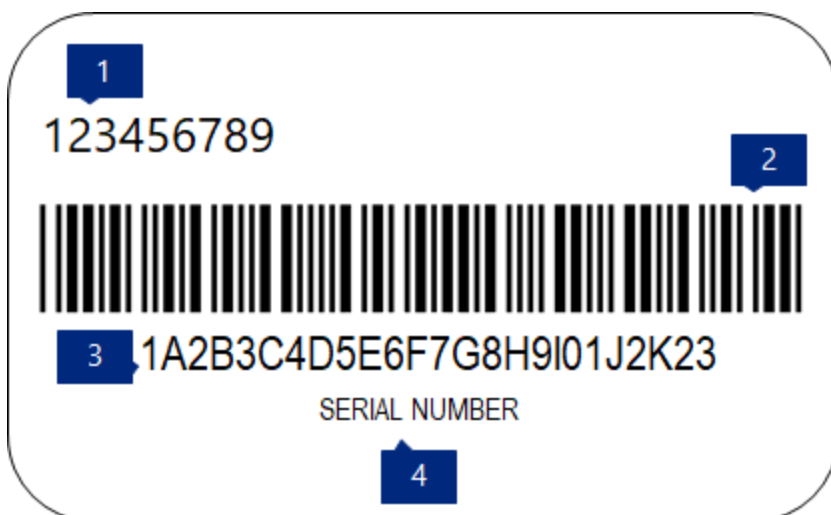
3.2.4 Part Label Placement and Control

1. Label is to be applied on the part/kit flattest surface. If the part/kit is contained on a skid the ship label sides must be positioned outward making it clearly visible to TK Elevator material logistics personnel. Additional considerations should be addressed when determining the most appropriate location for the label or segments of the label:
 - Survivability of the label.
 - Label application (manual/automatic, label/tag /direct marking).
 - Container type.
 - Packaging level (if multiple labels or bar code symbols are visible).
 - Accessibility of location. Each supplying location shall be responsible to ensure that bar code marked labels and tags are sufficiently secured and protected and applied wrinkle-free so that they are readable at the point of final TK Elevator usage.
2. Labels should be placed no closer than 1.25 inches (32 mm) from any part/kit edge. When label locations are identified on TK Elevator containers (especially on returnable containers), they shall not be applied outside the defined area.
3. Because labels must be accessible for scanning at shipping, transportation, and receiving operations, labels or tags should be applied in an easily accessible location.
4. When multiple labels are used on a container, all labels shall be identical, including the package identifier. The label should not be placed over a seam. Sealing tape, shrink-wrap, or bands shall not be placed over the label. These will interfere with the scanning of the label.

3.3 Serial Number

The individual item serial number is required to help TK Elevator comply with the record-keeping requirements for distribution. This specific serial number label applies only to purchased complete finished goods where serialization is required.

3.3.1 Serial Number Label Diagram



3.3.2 Serial Number Label Content

1. Part Number: The TK Elevator item number. Letter height .2 inch minimum.
2. Serial Number Barcode: Device serial number in barcode format. Barcode height .5 in., x-dimension (narrow bar) 13-17 mils.
3. Serial Number: Device serial number. Letter height .2 inch minimum.
4. Serial Number Label Identifier: Letter height .2 inch minimum.

3.3.3 Serial Label Specifications

- Label Type: “Piggyback” type label where the label can be peeled off and applied. again. Use Avery part number 5735 or similar (www.avery.com).
- Label dimension: minimum 1-5/8 inch x 4 inch.
- Label color: White paper with black printing.
- Type font: Arial true type, all bolded except serial number label identifier.
- Barcode type: Code 3 of 9 symbology.

3.3.4 Serial Number Label Placement and Control

One label is required per serialized item. The serial number shall be applied directly to the product. Location to be determined by the supplier. Size to be determined by type of component with font to be human readable. Specific placement instructions provided part engineering drawing.

3.4 Ship Label

(P) Part Number: 196DXE002			
			
(7Q) Quantity and Unit of Measure 5 EA	(1D) Date of Manufacture DD/MM/YY	(R) Revision A	
(K) P.O. NUMBER:MDTA026702	5REQ YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Contract Number XYZ123	
(S) SERIAL NUMBER 1A2B3C4D5E6F7G8H9I01J2K23		(Z) Description Description of Item	
Supplier Name and Address of Manufacture Location			

3.4.1 Ship Label Content

These load standards apply to individual boxes that are grouped together and shipped on a unit load, skid or pallet. Skid shipments are configured as:

1. Part Number:

The TK Elevator part/item number that is identified as Item on the TK Elevator Purchase Order. This information can be found in the Item Number field. Letter height to be 0.5-inch minimum. The data identifier for this field shall be "P".

2. Quantity:

This is the standard number of components inside the individual package or box. This field will be up to 8 characters in length plus the data identifier. The data identifier shall be "Q" for quantities labelled as each (the default). All others shall use the data identifier "7Q" with the quantity followed by two alphanumeric characters representing the ANSI X.12.3 unit of measurement code specified in the TK Elevator Purchase Order. Letter height to be 0.4-inch minimum. All package quantities received are expected to conform to the standard container quantity established for each component as designated

On the TK Elevator Purchase Order. Exceptions are limited to emergency quantity shipments originated by your designated commodity manager.

3. TK Elevator Purchase Order Number:

This number, up to 10 characters in length plus the data identifier, is as designated in the TK Elevator Discrete Purchase Order provided by Purchasing. Letter height to be 0.4-inch minimum. The data identifier for this field shall be "K". (As the supplier number and other pertinent information is contained within the TK Elevator Purchase Order, there will not be a need for a separate supplier number field.)

4. Serial Number:

Sequential, non-repeating number assigned to each container by the supplier. The maximum length of the serial number shall not exceed 24 alphanumeric characters plus the data identifier. Letter height to be 0.2-inch minimum. For purchased complete finished goods, the serial number will be the device serial number if serialization is required.

5. Revision Level:

This is the revision level of the part. The data identifier shall be "R". The maximum length of the revision level shall not exceed 3 alphanumeric characters plus the data identifier. Letter height to be 0.4-inch minimum. It is identified as 'Rev' on the TK Elevator Supplier Schedule. For suppliers issued a TK Elevator Discrete Purchase Order, this information can be found in the Item Rev field.

6. Date of Manufacture:

This is the date of manufacture in the DD/MM/YY format. The data identifier SHALL be “1D”. The maximum length of the serial number shall not exceed 10 alphanumeric characters plus the data identifier. Letter height to be 0.4-inch minimum. [This field can be defined as manufacture, expiration or some other date requirement. I recommend that it be consistent throughout and spelled out on the P.O. Recommend asking if programming can have an alert pop up on the operator reader screen if the expiration time period from the manufacture date has been exceeded. That way we can stick with one date designation.]

7. TK Elevator Item Description:

The maximum length of the item description should not exceed 20 alphanumeric characters, including dashes and spaces, plus the data identifier. The data identifier shall be “Z”. Letter height to be 0.2-inch minimum. The part description shall be specified on the TK Elevator Discrete Purchase Order.

8. 5REQ

In the process of receiving 5REQ materials, necessary items needed are the purchase order, job number, quantity, packing list number, and the part is always “5 REQ”. The job number is used to identify which line to receive because many purchase orders have multiple jobs on it. This area for the label is for the job specific alphanumeric sequence. This alphanumeric sequence must be human readable. This sequence shall consist of three letters followed by 3 numbers.

10. 2D Barcode

This area on the label is for special information as determined between TK Elevator and the Supplier as necessary to be displayed. If the data does not need to be encoded into the 2D barcode (Please avoid if possible as this can constrain the system), then NO data identifiers are needed. [PREFERRED]

IF this information is necessary to be encoded into the 2D barcode, the data identifier shall be “1Z”. If this area is needed to be subdivided for additional information blocks, then the subsequent data.

3.5 Load Label

These load standards apply to individual boxes that are grouped together and shipped on a unit load, skid or pallet. Skid shipments are configured as:

- **Master Load:** This represents a unit load that houses multiple boxes of a single part/item number.
- **Mixed Load:** This represents a unit load that houses boxes of more than one part/item number.

Based on the unit load type, one of the following labels is required on each unit load.

3.5.1 Master Load Label

From: Supplier ABC 123 Sample Way Anywhere, AB 12345	To: TK Elevator Manufacturing 600 S Main St. Middleton, TN 38052	
(P) Part Number: 196DXE002 	(R) Revision: A SKID 1 of 2	
(7Q) Quantity and Unit of Measure: 5 EA 	(K) P.O. Number: MDTA026702 	
(S) Serial Number: 1A2B3C4D5E6F7G8H9I01J2K23 	(Z) Description: Description of Item	
MASTER LOAD		

3.5.1.1 Master Load Label Content

1. Supplier Name/Location:

The supplier name, city, state and zip code. Many shippers require a ship from the address on the label. The Arial Narrow font size of the Supplier ship from address should be adjusted to allow the address to fit within the designated block area.

2. Ship to Address:

Many shippers require a ship to address on the label. The Arial Narrow font size of the TK Elevator ship to address should be adjusted to allow the address to fit within the designated block area.

3. Master Label Identifier:

Identifying header for a skid that houses a single part/item number. Letter height to be .5-inch minimum. Font should be Narrow Arial.

4. Part/Item Number:

The TK Elevator part/item number that is identified as Item on the TK Elevator Discrete Purchase Order. This information can be found in the Item Number field. This field will be up to 14 characters in length plus the data identifier. Letter height to be 0.4-inch minimum. The data identifier for this field shall be "P".

5. Revision:

This is the revision level of the part. The data identifier SHALL be “R”. The maximum length of the revision level shall not exceed 3 alphanumeric characters plus the data identifier. Letter height to be 0.4-inch minimum. It is identified as ‘Rev’ on the TKE Supplier Schedule. For suppliers issued a TKE Discrete Purchase Order, this information can be found in the Item Rev field.

6. Skid ___ of ___:

Sequential number assigned to the individual skid and the total number of skids represented by the packing list. The total number of skids accounts for all skids, regardless if the shipment is a mixture of Master and Mixed. Letter height to be 0.2-inch minimum.

7. Quantity:

This is the total quantity of all individual boxes of a single part/item number contained on the shipping unit conveyance (Pallet, slip sheet, bundle, etc.). This field will be up to 8 characters in length plus the data identifier. Human readable letter height to be 0.4-inch minimum. The data identifier shall be “Q” for quantities labelled as each (the default). All others shall use the data identifier “7Q” with the quantity followed by two alphanumeric characters representing the ANSI X.12.3 unit of measurement code specified in the TK Elevator Discrete Purchase Order. Exceptions are limited to emergency quantity shipments originated by your designated commodity manager.

8. Serial #:

Sequential, non-repeating number assigned to each pallet load by the supplier. The data identifier shall be “S”. The maximum length of the serial number shall not exceed 24 alphanumeric characters plus the data identifier. Letter height to be 0.2-inch minimum.

9. TK Elevator Purchase Order Number:

This number, up to 10 characters in length plus the data identifier, is as designated in the TK Elevator Discrete Purchase Order provided by Purchasing. Letter height to be 0.4-inch minimum. The data identifier for this field shall be “K”. (As the supplier number and other pertinent information is contained within the TK Elevator Purchase Order, there will not be a need for a separate supplier number field.)

Sequential number assigned to the individual skid and the total number of skids represented by the packing list. The total number of skids accounts for all skids, regardless if the shipment is a mixture of Master and Mixed. Letter height to be 0.2-inch minimum.

10. Item Description:

This cell of the label is for a short description of the content of the skid, crate, etc. This must be human readable. The data identifier for this field shall be “Z”.

Note:

A data identifier is a character that follows the start character of the bar code symbol and is used to identify the information immediately following it. Barcode symbology to be PDF417.

3.5.2 Mixed Load Label

From: 1 Supplier ABC 123 Sample Way Anywhere, AB 12345	To: 2 TK Elevator Manufacturing 600 S Main St. Middleton, TN 38052	3 Skid 1 of 3
4 <h1 style="text-align: center;">Mixed Load</h1>		

3.5.2.1 Mixed Load Label Content

1. Supplier Name/Location:

The supplier name, city, state and zip code. Many shippers require a ship from the address on the label. The Arial Narrow font size of the Supplier ship from address should be adjusted to allow the address to fit within the designated block area.

2. Ship to Address:

Many shippers require a ship to address on the label. The Arial Narrow font size of the TK Elevator ship to address should be adjusted to allow the address to fit within the designated block area.

3. Skid ___ of ___:

Sequential number assigned to the individual skid and the total number of skids represented by the packing list. The total number of skids accounts for all skids, regardless if the shipment is a mixture of Master and Mixed. Letter height to be 0.2-inch minimum.

4. Mixed Load:

Identifying header for a skid that houses multiple part/item numbers. Letter height to be 1.0-inch minimum.

3.5.3 Load Label Specifications

- **Label Dimension:** Label size is 4 inches high by 6.5 inch wide.
- **Label Color:** White paper with black printing.
- **Type Font:** Arial OR Arial Narrow font, all bolded except supplier name and part/item description.

3.5.4 Load Label Placement and Control

- Load labels should be placed in one of the four upper left corners of the skid.
- Labels should be placed on the outside of the skid's protective covering so that the label can be discarded when the protective covering is removed.
- Load labels must be clearly visible to TK Elevator Material Logistics employees.


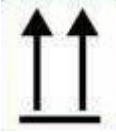



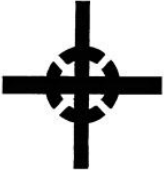
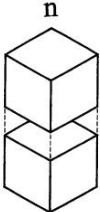

3.5.5 Special Handling Instructions/Labels

All special handling labels shall conform to ISO/ASTM iconography. A standard black and white label should be applied.

Suppliers should place labels on two sides of boxes/skids if necessary to warn of following:

- Top load
- Do not double stack
- Do not triple stack
- Corrosion
- Electrostatic discharge
- Overweight or lift assist required
- Acceptable stacking limits
- Center of mass / center of gravity shall be applied to any package that is not weight balanced.

Icon examples per ASTM D5445 and ISO 780 - Larger list [located in the appendix](#)

3.6 New Revision Labels

For new products or product revisions, the supplier will be sent instructions for labels to attach to the box(s), skid, or container and packing slip when the new revised part/item is sent to TK Elevator FOR THE FIRST TIME. This label will alert TK Elevator personnel that a new revised part/item is in house so that old revision parts/items can be disposed of properly. The supplier should contact their appropriate MM when more labels are needed.

The container ship label, Master ECN label and packing list must list the correct revision.

4.0 TKE Packaging Materials & Form Factors

4.1 General Guidelines

These guidelines are designed to establish general rules or principles to accommodate for the best packaging solutions. This guideline section informs the user about the type of packaging that may be most suitable for their product. This section does not encompass all types of packaging or packaging situations. Choosing the right type of packaging helps to ensure delivered quality and consistency.

All illustrations are for reference only.

4.1.1 General packaging design principles

The following are general design principles:

- Keep products free from damage.
- Packaging shall be designed with no [defects](#).
- Maximize handling effectiveness.
- Maximize storage volume.
- Packaging materials should conform to [TKE sustainability objectives](#).
- Provide efficient and safe packing and unpacking methods.
- Clearly display packaging labels.
- Size and weight restrictions will be determined in the PPAP process.
- Weight distribution shall be balanced throughout each package and unit load.
- Hazmat packaging shall meet all material packaging requirements.

4.2 PKG Decision Matrix / Delivery Quantity by Item Class & Velocity Code

Category	Sub Category	Unit load	Packaging Form Factors See section for requirements			
			Packaging Form Factors	Packaging Form Factors	Packaging Form Factors	Packaging Form Factors
Power & Movement	Ropes/Belts	Crate or Pallet	Reels	Corrugated Box		
	Machines	Crate or Pallet				
	Electric Motors	Crate or Pallet	Injection Molded Tray	Corrugated Box		

	Valves	Crate or Pallet	Injection Molded Tray	Corrugated box	Bulk bin/ Gaylord	
	Roller Guides	Pallet	Corrugated box	Bulk bin/ Gaylord		
Mechanical Assemblies	Guide Rails	Stringers				
	Doors	Crate or Pallet	Corrugated box			
	Shackles	Crate or Pallet	Corrugated Box	Bagged		
	Pumps	Pallet	Injection Molded Tray	Corrugated box		
	Oil Buffers	Crate or Pallet	Corrugated Box			
	Safeties	Crate or Pallet				
	Governors	Crate or Pallet				
Fabricated Components	Castings	Pallet	Corrugated box	Bulk bin/ Gaylord		
	Stampings	Pallet	Bagged	Corrugated box		
	Forgings	Pallet	Corrugated box			
	Machined components	Crate or Pallet	Corrugated box			
	Sills	Pallet	Corrugated box	Bulk bin/ Gaylord		
	Counterweights	Pallet				
	Extrusions	Pallet				

	Silencers	Crate or Pallet	Corrugated box			
	Sheaves	Crate				
Functional Components	Direct Fasteners	Crate or Pallet	Corrugated box	Bagged		
	Seals & Rubber	Pallet	Corrugated box	Tubes		
	Door Reels	Pallet	Corrugated box			
	Isolation Pads	Crate or Pallet	Bagged	Corrugated box		
	Injection Molded Parts	Crate or Pallet	Bagged	Corrugated box		
	Springs/Bushings	Crate or Pallet	Bagged	Corrugated box	Bulk bin/ Gaylord	
	Bearings	Crate or Pallet	Bagged	Corrugated box		
Contract Manufacturing & Misc Electronics	PCBA's	Pallet	Bagged	Corrugated box		
	Sensors/Switches/Relays	Pallet				
	Wires/Cables	Pallet	Drum	Reels	Bagged	Corrugated box
	Fittings	No (Parcel)	Corrugated box			
	Locks	No (Parcel)	Bagged	Corrugated box		
	Batteries/UPS	Pallet	Corrugated box			

Macro Electronics & Elevator Trim	Call Stations	No (Parcel)	Bagged	Corrugated box		
	Hall Fixtures	No (Parcel)	Bagged	Corrugated box		
	Protection Pads	Pallet	Corrugated box	Bagged	Poly Wrapped	
	Labels	No (Parcel)	Bagged	Corrugated box		
	Cabs & Finishes	Pallet	Corrugated box	Bagged		
	Power Distribution	Crate or Pallet				
	Data Networking	Pallet	Corrugated box	Bagged		
	Enclosures (populated)	Pallet	Corrugated box			
Power Management & Control	Drives	Pallet	Bagged	Corrugated box		
	Encoders	No (Parcel)	Corrugated box			
	Power Supplies	Pallet	Corrugated box	Bagged		
	Transformers	Crate or Pallet	Corrugated box			
	Chokes					
	Lights	Crate or Pallet	Bagged	Corrugated box		
Raw Components	Flat Steel	Pallet				
	Long Steel	Stringers				

	Paint	Pallet	Pail	Drum	Corrugated box	Bagged
	Resin	Pallet	Drum	Corrugated box	Pail	
	Hydraulic Fluid	Pallet	Pail	Jerry Can	Drum	
Packaging & MRO	PPE	No (Parcel)				
	Corrugated Board	Pallet				
	Indirect Fasteners	No (Parcel)	Bagged			
	Maintenance Items					
	Service Contracts					
	Fork Lifts					
	Capital Investments					
	Compressed Gas					
	Chemicals	Pallet or IBC	Drum	Pail	Jerry Can	
	Adhesives	Pallet	Drum	Jerry Can	Pail	
	Lumber/Crates	Crate or Pallet				

4.3 Packaging Categories

4.3.1 Rigid and Flexible Plastic

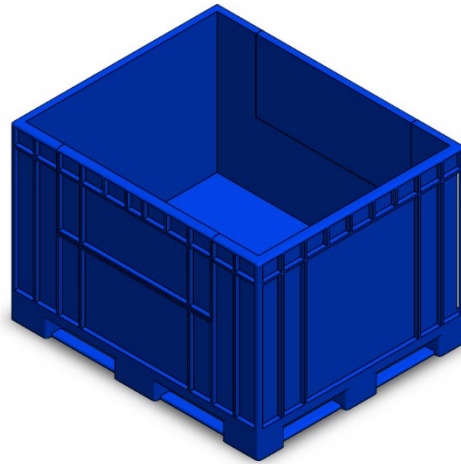
4.3.1.1 Returnable Plastic Container

A returnable plastic container is a plastic container designed to be used for more than one shipment. The container can be a tote or a bulk bin style.

Performance Requirements

Returnable plastic containers must meet the following requirements under normal distribution conditions:

- Accommodate 4-way entry only for bulk bin style containers.
 - Tote style containers will not require fork handling.
- For tote sized returnable plastic containers, reference size and weight restrictions.



4.3.1.2 Pail

A pail is a cylindrical, watertight container. A pail will have a lid to hold the contents inside and allow for stacking. Pails' capacities typically range from 1 to 12 gallons.

Performance Requirements

Pails must meet the following requirements under normal distribution conditions:

- Resist contamination, leaking, and spilling throughout distribution.
- Pails must be stackable.
- Pails must have a handle.
- Accommodate between 1 and 12 gallons of product.



4.3.1.3 Poly Bag

A bag is a pre-formed container made of flexible material to contain and/or protect products or parts. Bags are generally closed on all sides, except one, which forms an opening that may or may not be sealed after filling. Poly bags are often used for products placed into a box, bin, tote, or crate.



Performance Requirements

Bags must meet the following requirements under normal distribution conditions:

- Utilize material that resists ripping, tearing, and bursting.
- Remain sealed throughout distribution.
- Minimize air space within the bag.

4.3.1.4 Plastic Molded Trays

Injection molded trays are custom trays that are created by injection molding or thermoforming sheets of plastic. These trays are typically used as a component in a reusable packaging system and are often designed to contain and protect specific parts.



Performance Requirements

Injection molded trays must meet the following requirements under normal distribution conditions:

- Trays must contain product and limit movement during distribution and handling and protect all products contained with from physical and cosmetic damage.
- If the trays are designed to be reusable, asset tracking is needed and should be coordinated and approved by TKE
- If the trays are designed to be disposable, they should be composed of a single polymer that is easily recycled such as HDPE; TKE will need to approve anything material other than HDPE. The trays should be marked with the appropriate plastic symbol & number

4.3.1.5 Foam

Foam is most often used as a cushioning/bracing packaging material. Foam is very versatile and can be both flexible and rigid.

Performance Requirements

Foam must meet the following requirements under normal distribution conditions:

- Utilize material that will resist tearing and ripping.
- Utilize anti-static or conductive material for any electrostatic sensitive item such as printed circuit boards.



4.3.2 Bulk Containers

4.3.2.1 Intermediate Bulk Containers

Intermediate bulk containers (IBCs) are reusable, pallet-mounted containers for handling, storage, and transport of liquids. They are capable of being stacked and are most commonly moved by pallet jack or forklift. IBCs can usually be categorized as either rigid, folding, or flexible.

Performance Requirements

IBCs must meet the following requirements under normal distribution conditions:

- Reference: <https://ribca.org/>
- Have a design that resists leaks, spills, and contamination.
- Accommodate 4-way entry (can be lifted from all 4 sides by a fork truck).
- Have a design that accommodates handling by forklift and pallet jack.



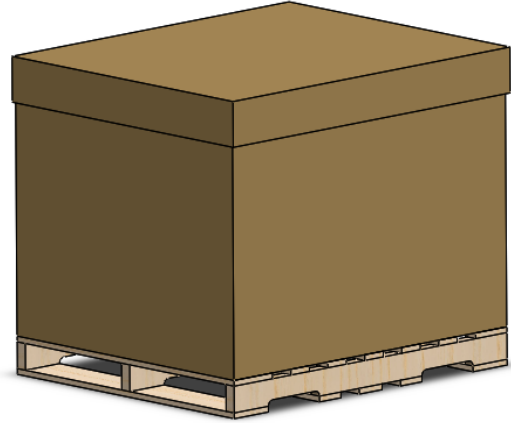
4.3.2.2 Bulk Bin/ Gaylord

A bulk bin is in a large container used to store items or parts in bulk. Bins are often corrugated and can be stored and filled with pickable parts. Bulk bins are often placed on top of pallets to improve handling and storage.

Performance Requirement

Bulk bins/gaylords must meet the following requirements under normal distribution conditions:

- Contain and protect all products.
- Minimize headspace as much as possible.
- If shipped on a pallet, the bin must not overhang the pallet.
- Utilize lids or easy opening features to minimize safety knife use.
 - Lids that can be lifted off are encouraged.
 - If a safety knife needs to be used, it should be easy to remove.
- Utilize corrugated material that is strong enough to be stacked 102in high.



4.3.2.3 55 Gallon Drums

A drum, sometimes referred to as a barrel, is a cylindrical container. Most often, drums are used to ship liquids or powders. They are often loaded onto pallets to improve handling.

Performance Requirements

Drums must meet the following requirements under normal distribution conditions:

- Must resist contamination, leaking, and spilling throughout distribution.
- Use a standard chemical pallet ([CP pallets](#)).
 - Additional [CP pallet details](#): Chart located on pg. 17 of the link.
- A maximum of 1 layer of drums is allowed if the drum **is not** secured to a pallet.
 - Stacking multiple layers of drums is allowable if each layer **is** secured to a pallet.
- When shipped on pallets, no overhang is permitted.
- Preferred to use a drum that has end of life options.
- Drums shall be securely fastened to the pallet. Fastening methods include strapping, stretch wrap, or a combination of multiple fastening methods.
- If material contained is hazardous, drums must meet relevant regulatory packaging requirements. For more information, reference [Federal Motor Carrier Safety Administration \(FMCSA\) - 49CFR - Subpart 172](#).

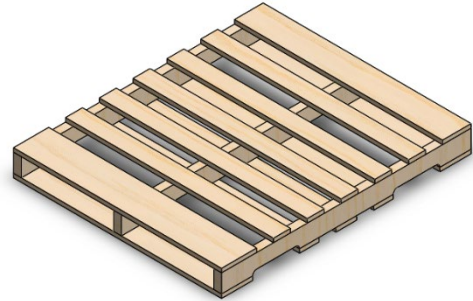


4.3.3 Wood Packaging

All wood packaging shall conform to the International Standards for Phytosanitary Measures Publication No. 15 ([ISPM 15](#)).

4.3.3.1 Pallet

A pallet is a flat structure used for the storage, assembling, and transport of products or packages. Pallets support goods in a stable fashion when being transported by forklift, pallet jack, front loader, etc.



Performance Requirements

Pallets must meet the following requirements under normal distribution conditions:

- Reference <https://www.palletcentral.com/>
- New pallets to have a minimum strength 2x what they are carrying.
- Used pallets to be class 2 or better (Reference pg 35 of [Uniform Standard for Wood Pallets](#)).
 - **Class 1:** Repaired pallets shall be permitted to contain metal plates, but no companion stringer repairs.
 - **Class 2:** Repaired pallets with one or two stringers repaired using plugs and/or notched blocks or longer companion stringers. Prefer a max of 500 lbs.
- Accommodate 4-way entry (can be lifted from all 4 sides by a fork truck)
- Whenever possible, pallets should be 48inx40in, in size. Custom pallets may be used for products that are larger than 48inx40in.
- Utilize the fasteners referenced [fastener](#) section of this document.
- All deck boards require a minimum of 2 fasteners at each [construction joint](#). Deckboards wider than 3 inches require a minimum of 3 fasteners at each [construction joint](#).
- All [construction joints](#) should be flush and must have a gap of no more than 1/8 inch between the parts being fastened together.
- Pallets shall not weigh more than 2000 lbs.

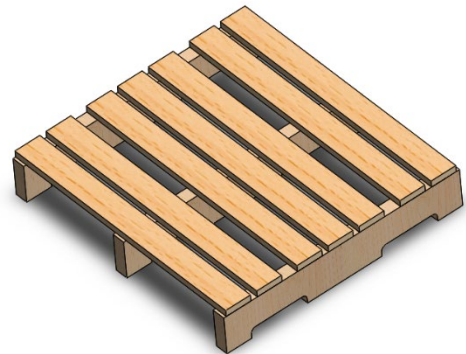
4.3.3.2 Skid

A skid is a series of parallel stringers supporting top deckboards for the product/package to sit on. A skid is different from a pallet because it lacks bottom deckboards.

Performance Requirements

Skids must meet the following requirements under normal distribution conditions:

- Reference : <https://www.palletcentral.com/>
- Must be designed with a safety factor of 2.



- This means pallets must be designed to support twice as much weight as will actually be loaded onto them.
- Accommodate 4-way entry (can be lifted from all 4 sides by a fork truck).
- Resist cracking, splitting, or collapsing.
- Unless a specific skid size is required, a 48inx40in skid is required.
- Utilize fasteners referenced in the wood [fastener](#) section of this document.
- All deckboards require a minimum of 2 fasteners at each [construction joint](#).
- Deckboards wider than 3 inches require a minimum of 3 fasteners at each [construction joint](#).
- All [construction joints](#) should be flush and must have a gap of no more than 1/8 inch between the parts being fastened together.
- Skids shall not weigh more than 2000 lbs.

4.3.3.3 Stringers

A stringer is a piece of wood or metal used to hold the product off the ground. Stringers are usually used to support heavy, oblong-shaped parts. These support the product and elevate the product enough to drive pallet jacks and forklift tines underneath.



Performance Requirements

Stringers must meet the following requirements under normal distribution conditions:

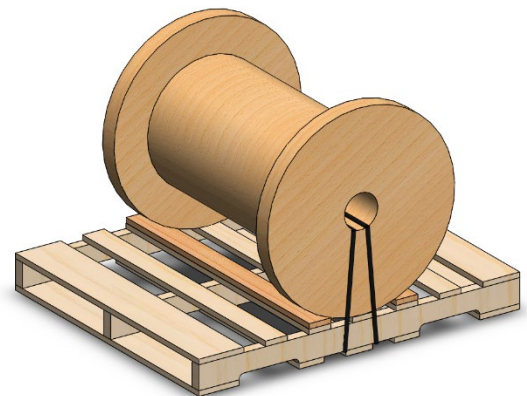
- Keep load off the floor to accommodate for the use of fork trucks and pallet jacks.
- Be wide enough to resist rotating and strong enough to avoid unit load collapse, 2:1 max height to width.
- Designed so the strap holding the support to the load is not in direct contact with the floor. Elevating the strap off the floor is commonly achieved by adding a [dado](#) to the bottom of wood runners.

4.3.3.4 Reels

A wooden reel is a cylindrical structure in which flexible materials can be wound on. Also commonly referred to as spools. Reels can be placed on a pallet to improve handling efficiency.

Performance Requirements

Wooden reels must meet the following requirements under normal distribution conditions:



- The product needs to be wound and secured to the wooden reel to stay in place on the reel throughout distribution.
- Reels that are shipped on pallets must not overhang the pallet.
- Reels that are shipped on pallets must be strapped to the pallet.
- Ship wooden reel in on flange.

4.3.3.5 Crate

A crate is a shipping container that is assembled with nails, bolts, or an equivalent method of fastening. Crates can sometimes be reusable, and other times they are not. Crates can be enclosed or open.



Performance Requirements

Crates must meet the following requirements under normal distribution conditions:

- Crates must have a 4-way entry.
- Crates must hold contents without cracking, splitting, or collapsing all the way through the supply chain and to final delivery.
- Crates must be stackable.
- Crates shall not weigh more than 2000 lbs.
- All [construction joints](#) should be flush and must have a gap of no more than 1/8 inch between the parts being fastened together.

4.3.3.6 Wood Fasteners

Fasteners must be sufficient to maintain the integrity of pallets throughout the entire distribution process, from manufacturing to the end-user. If any of the following conditions are not met, the unit load will be considered non-compliant and may be refused.

- Fasteners must be at least 2 inches.
- Fasteners must at least flush the surface of the wood material and must be driven no more than 0.25in below the surface of wood material.
- Fasteners must be strong enough to resist shearing or breaking in normal distribution conditions.
- Nails at or over 0.099 ring shanks diameter and have a featured shank.

- Do not use any nails smaller than 0.099.

Plain Shank Nails

Staples

Glue Coated Screw or Ring Shank Nails

Screws

Prohibited



Prohibited



Acceptable



Acceptable



4.3.4 Other

4.3.4.1 Jerry Can

A jerry can is a robust container designed to hold 5.3 gallons of liquid. Jerry cans can either be steel or plastic.



Performance Requirements

Jerry cans must meet the following requirements under normal distribution conditions:

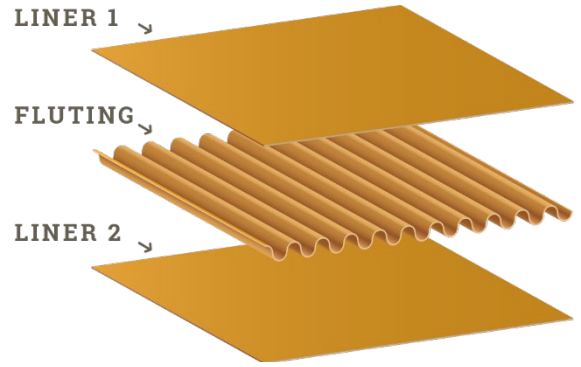
- Resist contamination, leakage, and spillage throughout distribution.
- Jerry cans must be resealable.
- If material contained is hazardous, jerry cans must meet relevant regulatory packaging requirements. For more information, reference [Federal Motor Carrier Safety Administration \(FMCSA\) - 49CFR - Subpart 172](#).

4.3.4.2 Corrugated Container

Primary and secondary packaging must be sufficient in design to contain and protect products throughout the entire distribution system.

Corrugated Fiberboard Container - A box or tray made from corrugated fiberboard.

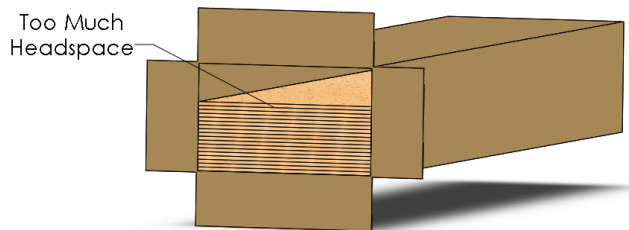
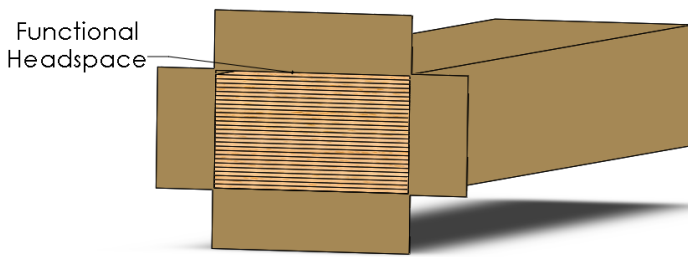
Corrugated Fiberboard - A paper-based sheet made up of at least 3 layers with an inner liner, medium (flutes), and an outer liner. Often referred to as “cardboard.”



Performance Requirements

Corrugated containers must meet the following requirements under normal distribution conditions:

- Utilize a design and material that is sufficiently strong to resist crushing when unitized and stacked with like items up to 102in tall.
- Completely contain the product associated with it and remain free of tears and holes.
- Glue flaps must stay sealed until being intentionally opened.
- Minimize box height to allow for [functional headspace](#) only. Boxes can have no more than 10% of volume used as headspace. If this is not achievable, you may request an exemption from headspace requirements from TKE Exemptions.



Minimum Board Grade Recommendations

The chart below is for reference. It lays out corrugated strength and material recommendations set forth by the NMFC item 222 section 3. It does not guarantee that material selection will be sufficient for a given application. Work with a corrugated supplier to ensure the correct board grade is chosen for a given application.

Maximum Weight of Box and Contents	Maximum Outside Dimensions	Minimum Combined Weight of Facings	Minimum Mullen Burst Test	Minimum ECT
------------------------------------	----------------------------	------------------------------------	---------------------------	-------------

					(Edge Crush Test)
pounds	L + W + D (inch)	includes all layers	pounds per square inch		pounds per inch
Single Wall					
20	40	52	125		23
35	50	66	150		26
50	60	75	175		29
65	75	84	200		32
80	85	111	250		40
95	95	138	275		44
120	105	180	350		55
Double Wall					
80	85	92	200		42
100	95	110	275		48
120	105	126	350		51
140	110	180	400		61
160	115	222	500		71
180	120	270	600		82
Triple Wall					
240	110	168	700		67
260	115	222	900		80
280	120	264	1100		90
300	125	360	1300		112
Solid Fiberboard Boxes					
20	40	114	125		N/A
40	60	149	175		N/A
65	75	190	200		N/A
90	90	237	275		N/A
120	100	283	350		N/A

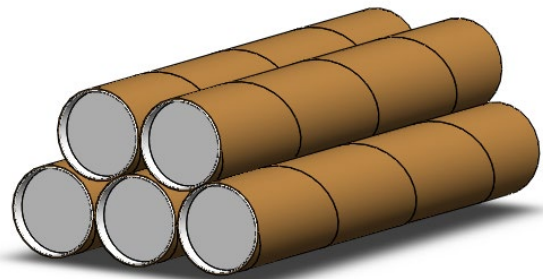
4.3.4.3 Tubes

A tube is a cylindrical paperboard container, convolutedly or spirally wound. Ends can be made of wood, plastic, metal, or a combination of materials.

Performance Requirements

Tubes must meet the following requirements under normal distribution conditions:

- Empty space in the tube shall be minimized.
- Tubes must be sealed.
- The seal must prevent end plug blowouts.
- Tube size walls must prevent products from bursting through.



4.3.4.4 Specialty Packaging

Certain products need special and or additional packaging materials or consideration. The following outline some of these special conditions that may require special packaging.

4.3.4.4.1 Electrostatic discharge (ESD) sensitive products

Typically, products needing ESD protection contain electronics such as printed circuit boards (PCBs). The supplier is responsible for utilizing the appropriate type of protection such as films, foams, or corrugated containing antistatic or conductive additives. Certain products need special and or additional packaging materials or consideration.

4.3.4.4.2 Corrosion prone materials and components

Whether the products being supplied are either raw materials or fabricated products, certain products need special and or additional packaging materials or consideration. The following outline some of these special conditions that may require special packaging.

- Extreme temperatures
 - Heat
 - Cold
- UV exposure
- High humidity

4.3.4.4.3 A-surface protection

Stainless steel needs special and or additional packaging materials or consideration. The following outline some of these special conditions that may require special packaging.

- Extreme temperatures
 - Heat
 - Cold
- UV exposure
- High humidity

4.3.4.4 Hazardous materials (hazmat)

If any inbound materials are considered hazardous by the US Department of Transportation (DOT) and or International Air Transport Association (IATA), the supplier shall utilize approved hazmat packing systems and placard the shipment appropriately. Often, hazmat designated products are dependent upon the amount shipped. Substances and articles which are hazardous are assigned to a specific packing group as defined in 3.8.1 and may be determined by referencing 49 CFR 172.101 hazardous materials table.

5.0 Testing

It is the supplier's sole responsibility to ensure all packaging and unitized loads are sufficiently packaged/protected to pass all applicable ISTA Series 3 tests.

Suppliers to TKE are responsible for all related costs (direct and indirect) to modify their packaging to address non-compliance issues with the packaging and/or product, labeling, etc.

5.1 Pass/Fail Criteria

TKE shall not accept damage to any product; structural or cosmetic (broken, dented, scratches, etc).

For A-surface materials: surfaces with dents, cracks, scratches, or any other visible blemish are unacceptable.

For materials that do not have an A-surface, dents or scratches may be acceptable under some circumstances. However, if the performance of the product is affected, that is not acceptable.

Steps outlined in section 2.3 Material Return Policy will be taken to return to defective materials.

5.2 Test Reporting

Although TKE does not require suppliers to submit packaging or transit testing documents upon product introduction or new packaging introduction, TKE recommends testing in conjunction with first article delivery. However, TKE reserves the right to request packaging transit testing documents and certifications if the product is not meeting quality standards.

5.3 Testing Guidelines and Reference Documents

- [ASTM D4169-Standard Practice for Performance Testing of Shipping Containers and Systems](#)
- [ASTM D7386-Standard Practice for Performance Testing of Packages for Single Parcel Delivery Systems](#)
- [ISTA 3 Series: General Simulation Performance Tests](#)

6.0 Production Part Approval Process (PPAP)

Contact your supplier quality engineer for your PPAP requirements for your specific commodity.

- Packaging must meet the guidelines set forth in this document and will be evaluated as one component of the approval process.
- Products sent in for PPAP should represent final packaging and will be inspected for compliance within the defined guidelines.
 - Packaging design and materials shall conform to the matrix in Section 4.2.
 - If the packaging is non-conforming to the matrix or other requirements and recommendations of this document, pre-approval is needed prior to PPAP.

6.1 PPAP Form Example

Please note this is an example of the Parts Packaging Approval Form and not the entirety of the PPAP process. Contact you Supplier Quality Engineer to complete the PPAP process.



PARTS PACKAGING APPROVAL FORM

Single Part Information	
Project Name	PPAP No.
Package Owner	Supplier Location
Parts Package Type	
Single Part Primary Pack	
Insert Photo	
Package Drawings	
Dimensions(mm)	
Proof Test	
Gross Weight	
Description	
Comments	

General Information		
Part/Model Number	Part Name	Package Level
Batch/kitting Package Type		
Required Internal Dunnage/Drawing		
Insert Photo		
Package Drawings		
Dimensions(mm)		
Gross Weight		
Part quantity		
Description		
Comments		

Package and Transport	
Transport	Pallet Recycle
Loading method	Package Recycle
Package Type	
Pallet Configuration	
Insert Photo	
Package Drawings	
Dimensions(mm)	
Proof Test	
Quantity/Pallet	
Description	
Comments	

Supplier representative

Name	Title	Phone Number

Supplier Signature: _____ Date: _____

tkE Representative

Name	Title	Phone Number

tkE Signature: _____ Date: _____

6.2 Supplier Change Request Document

If a packaging change is being proposed, this change falls under the Supplier Change Request (SCR) process.

- Supplier must complete a Supplier Change Request (SCR) form and receive formal documentation approval from TK Elevator before making any changes.
- SCR form should be completed and sent in 60 days prior to the change taking affect.
- Supplier Change Request Forms are to be sent to the following:
 - NASupplierQualityTeam-NA@grouops.tkelevator.com
- Reviewed in a similar way to PPAP approval.

6.3 Supplier Change Request Form Example

This is an example of the change request form and instructions to complete- supplier must fill out separately. Obtain from your SQE.

Supplier Change Request Instructions

SCR Number: To be provided by TK SQ

General Information: Supplier name, location where product is manufactured and/or shipped form, contact information for requestor (phone number and e-mail address).

Change Requested Section:

1. Check the appropriate box for change being requested.
2. Provide a detailed description of the change that includes part numbers or families, revision level and part description, if part tooling or specifications are affected. If tooling is affected, is it supplier or customer owned tooling? If specifications are affected, which part of the specification needs to be changed? If a process is changing, what all is changing with the process? Attach any support documentation that explains or highlights the change in greater detail.
3. For location changes, provide address moving from and going to; detail any equipment or material that will move with location change.

Detailed Reason for Change Section:

1. Describe why the change needs to be made and attach any support documentation that explains or highlights the reason in greater detail.

Change Impact Section:

1. Check the appropriate box for what will be impacted by the change description
2. Make sure things impacted by the change are listed and covered in the change description.
3. Things to think about and mention: Does this change affect the part cost? If yes, document the estimated cost. Will an inventory of banked parts be required? What will new delivery dates, if delivery is impacted?

Supplier Implementation Plan:

1. Provide a start date for when change implementation is needed
2. Provide an estimated completion date on when change needs to be fully implemented.
3. Provide a detail project plan for process changes or location changes- this includes project managers, action items, Gantt charts, and detailed information for change completion. Any ECO change request will need to go through TK's ECO process, please allow for timing for completion.

Customer Approval:

1. To be completed by TK employees only

Supplier Change Request (SCR)									
				SCR Number					
Supplier Name				Date of Request					
Address				Requestor Name					
				Email Address					
				Phone Number					
Change Requested (Check all that applies)									
Part	<input type="checkbox"/>	Process	<input type="checkbox"/>	Tooling	<input type="checkbox"/>	Specification	<input type="checkbox"/>	Location	<input type="checkbox"/>
Other: (describe) _____									
Detailed Change Description:									
						Affected Part Number(s):			
						Attach Supporting Documents Here			
Detailed Reason for Change:									
								Attach Supporting Documents Here	
Change Impacts (Check all that applies)									
Drawings	<input type="checkbox"/>	Cost	<input type="checkbox"/>	Delivery	<input type="checkbox"/>	Performance	<input type="checkbox"/>	Specifications	<input type="checkbox"/>
Safety	<input type="checkbox"/>							Code	<input type="checkbox"/>
Other: (describe) _____									
Supplier Implementation Plan									
Start Date				Attach Project Plan Here					
Completion Date									
Plan Project Mgr.									
Comments:									
Customer Approval									
Approved-ECO Needed		<input type="checkbox"/>	ECO Number:				Approved- No ECO Needed		<input type="checkbox"/>
Rejected	<input type="checkbox"/>	Reason for Rejection:							
PPAP Required		Y	N	Comments:					
Supplier Quality		Commodity		Engineering		Manufacturing			
Print		Print		Print		Print			
signature		signature		signature		signature			
Date		Date		Date		Date			
Customer Feedback									

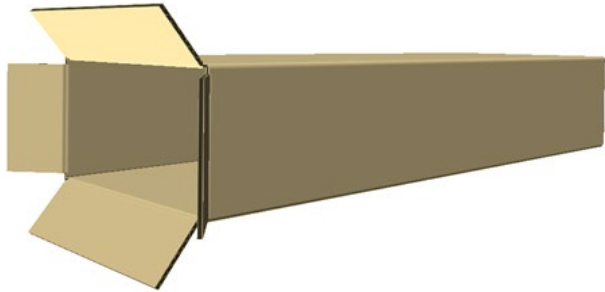

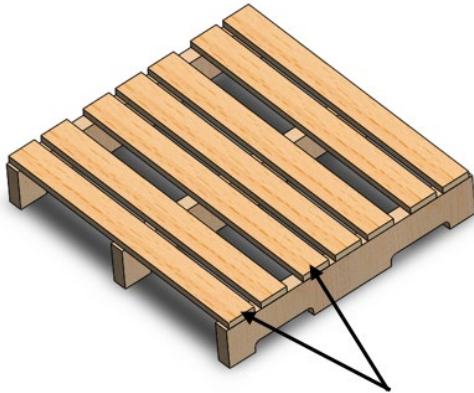
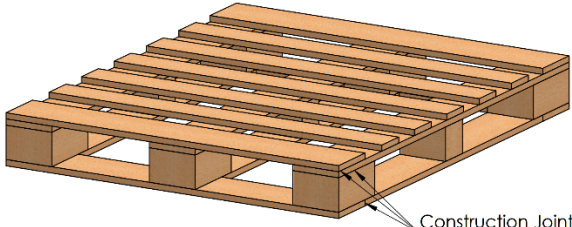
6.4 Document Revision History and Approvals

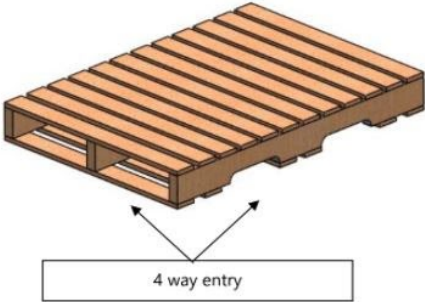
Revision History			
Revision Level	Revision Date	Nature of Change	Approver(s)
Rev 1	10/08/2021	Document creation	Chainalytics

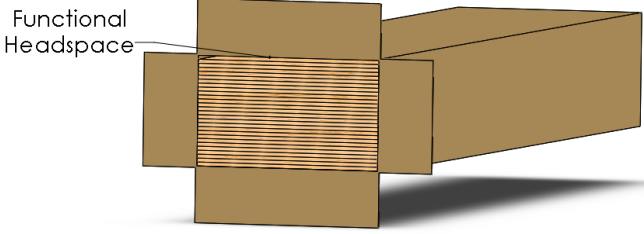


Approvals			
Document Author	Name	Title	Location/Company

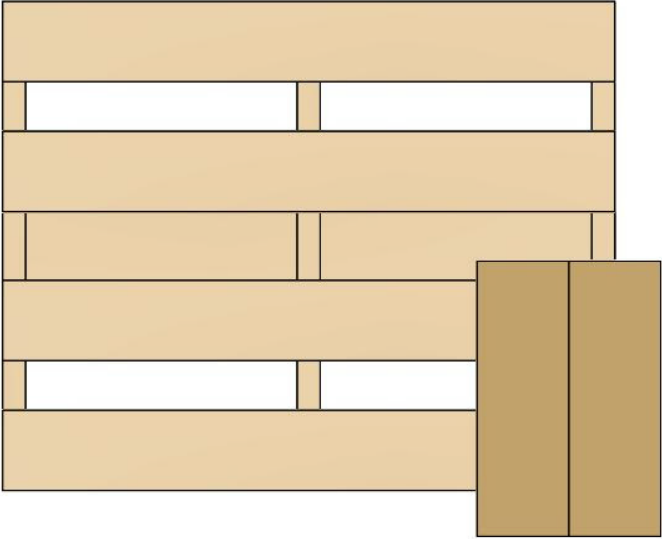


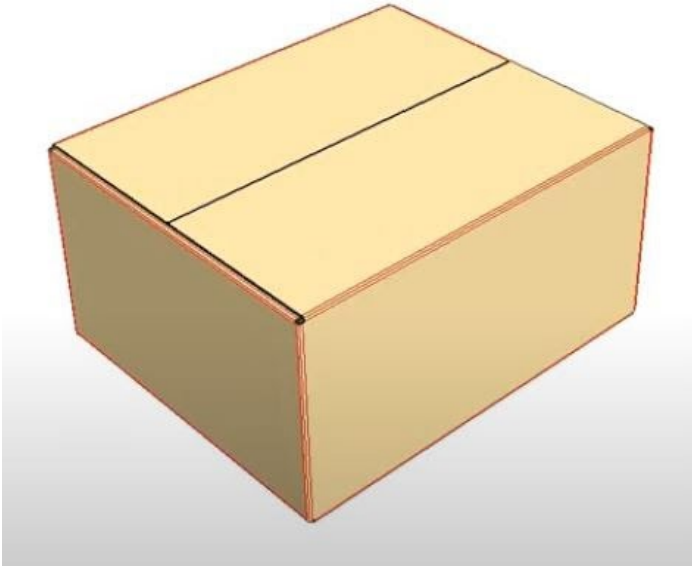
7.0 Appendix


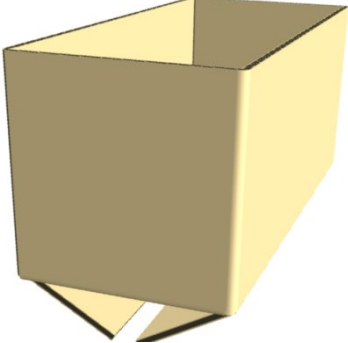
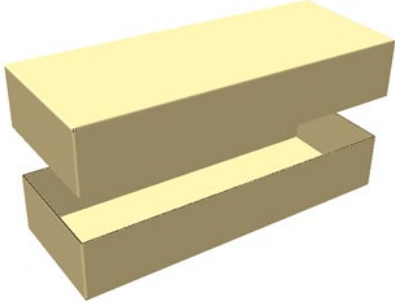

7.1 Terminology and Definitions

<p>Primary Package - Any packaging that directly touches and contains a product</p>	
<p>Secondary Packaging - A container enclosing one or more primary packages along with and required protective material(s)</p>	
<p>Deckboard - Members that sit perpendicular on top of or below the stringer to support the unit load. Pallets will have both top and bottom deck boards.</p>	
<p>Construction Joint - A point where two or more components meet in an assembled pallet.</p>	

<p>4-way Pallet Entry - Access the unit load from all 4 sides with a fork truck and pallet jack.</p>	
<p>Normal Distribution Conditions - This includes handling hazards such as lift truck handling, moving over dock plates, pallet jack handling, racked warehouse storage, floor load stacking, transport via rail, transport via sea, transport via truck, and manual handling.</p>	<p><i>No Image Included</i></p>
<p>ISPM 15 - An acronym that stands for International Standards for Phytosanitary Measures #15. ISPM 15 is a heat treating standard that aims to reduce the chances of transferring insects between continents. The standard is available for download at the link to the right.</p>	<p>The full document is available at the following link: https://cdn.ymaws.com/www.palletcentral.com/resource/collection/E8AADDDE-7CBA-4298-8341-C7F29D0C14FF/Uniform-Standard-for-Wood-Pallets-2014(REV).pdf Reference: Part III, section 12 (pg. 41)</p>
<p>SKU - “Stock Keeping Unit” this is an alphanumeric code that identifies each specific product type that is for sale.</p>	<p><i>No Image Included</i></p>

<p>Functional Headspace - The extra space in a case that is required in order to allow for product to be loaded into the package.</p>	 <p>The diagram shows a brown cardboard box with its top flaps open. A horizontal line is drawn across the interior of the box, and the space above this line is labeled 'Functional Headspace' with a leader line pointing to it.</p>
<p>Chemical Pallet (CP) - A pallet system with 9 standard designs for industry harmonization. Chemical pallets are typically used for drums and bags of powders and pellets.</p>	 <p>A photograph of a standard wooden pallet made of light-colored wood, showing its top surface and legs.</p>
<p>Fastener - a device that serves to secure one part to another</p>	 <p>The image shows three fasteners. On the left are two drill bits, one with a double-flute design and one with a single-flute design. On the right is a Phillips-head screw with a sharp point. Above each pair of fasteners is the word 'Acceptable' in green text.</p>
<p>Safety Factor - Testing a package to withstand multiple times the calculated stacking strength</p>	<p><i>No Image Included</i></p>

<p>Pallet Overhang - shipping units that make up the unit load hang over the edge of the pallet</p>	 <p>The diagram shows a wooden pallet with several horizontal slats. On the right side, two cardboard boxes are stacked on top of the pallet, extending beyond the right edge of the pallet's deck.</p>
<p>International Safe Transit Association (ISTA) -</p>	 <p>The logo for the International Safe Transit Association (ISTA) features a green circular icon with two white arrows forming a clockwise cycle, followed by the word "ista" in a bold, lowercase, green sans-serif font with a registered trademark symbol.</p>
<p>ASTM International - ASTM is an international standards organization that develops technical standards for a wide range of products.</p>	 <p>The logo for ASTM International consists of a blue circular icon with the letters "ASTM" in white, followed by the text "ASTM INTERNATIONAL" in blue and "Helping our world work better" in a smaller blue font below it.</p>
<p>RSC (Regular Slotted Container) - A box where all flaps are the same height and major flaps meet in the middle of the box.</p>	 <p>The image shows a 3D perspective view of a brown cardboard box. The top flaps are visible, meeting in the center of the box, which is characteristic of a Regular Slotted Container (RSC).</p>

<p>FOL (Full Overlap Container) - A box where all flaps are the same height and both major flaps are long enough to cover the entire opening of the box.</p>	
<p>HSC (Half Slotted Container) - A box that lacks flaps on one side and has RSC style flaps on the other side.</p>	
<p>Telescoping Tray Box - A box that consists of two separate pieces. These pieces include a top which fits over a bottom.</p>	
<p>Safety Knife - A spring-loaded knife with a self-retracting blade</p>	

Dado cut - The process of adding a groove to a board



Packaging Defects - Defects in packaging prevent the packaging from performing its intended functions. Functions that include protecting the inside contents during packing, handling, and storage.

No image included

7.2 Test Report Example

INTERNAL TESTINGS PACKAGING EVO 100 TKE								
PACKAGING 6J.0862.AN.6	REVIEW 0	PAGE 1 OF 13						
<p>ISTA 3B (International Safe Transit Association)</p> <p>INTERNAL TESTINGS</p> <p>PACKAGING EVO 100 – 6J.0862.AN.6</p>								
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Completed by:</th> <th style="width: 30%;">Date (tests)</th> <th style="width: 30%;">Date (review)</th> </tr> </thead> <tbody> <tr> <td>Pietro Cunio</td> <td>12/07/2021</td> <td>16/07/2021</td> </tr> </tbody> </table>			Completed by:	Date (tests)	Date (review)	Pietro Cunio	12/07/2021	16/07/2021
Completed by:	Date (tests)	Date (review)						
Pietro Cunio	12/07/2021	16/07/2021						

INTERNAL TESTINGS PACKAGING EVO 100 TKE								
PACKAGING 6J.0862.AN.6	REVIEW 0	PAGE 2 OF 13						
<p>Objective</p> <p>Perform the tests internally according to the ISTA 3B standard on the 6J.0862.AN.6 packaging sample.</p>								
<p>Tests sequence</p> <p>Sample Description 3</p> <p>Tests procedure 3</p> <p>Atmospheric condition 4</p> <p>Incline impact 4</p> <p>Free fall impact 6</p> <p>Pushing and rotation 7</p> <p>Elevated push and pull 9</p> <p>Flat push and rotate 9</p> <p>Forklift road course 11</p> <p>Border fall and face fall 11</p> <p>Evaluation post tests 13</p>								
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Completed by:</th> <th style="width: 30%;">Date (tests)</th> <th style="width: 30%;">Date (review)</th> </tr> </thead> <tbody> <tr> <td>Pietro Cunio</td> <td>12/07/2021</td> <td>16/07/2021</td> </tr> </tbody> </table>			Completed by:	Date (tests)	Date (review)	Pietro Cunio	12/07/2021	16/07/2021
Completed by:	Date (tests)	Date (review)						
Pietro Cunio	12/07/2021	16/07/2021						

INTERNAL TESTINGS PACKAGING EVO 100



PACKAGING 6J.0862.AN.8

REVIEW 0

PAGE 3 OF 13

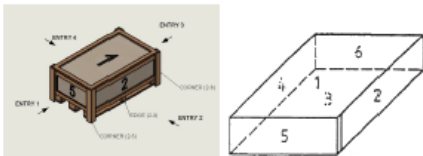
Sample Description

Packaging	6J.0862.AN.8 packaging sample
Components	18 x Cabin sills (4C.0393.DD.2)
Weight (empty)	96 kg
Weight (with material)	317 kg
Dimensions (external)	1610 x 930 x 620 mm



Tests procedure

Environmental conditions			
Start		End	
Date	12/07/2021	Date	12/07/2021
Hour	10:22:00	Hour	11:14:00
Temperature	18,6 ° C	Temperature	23,4
Humidity	82%	Humidity	66%



Completed by:	Date (tests)	Date (review)
Pietro Cunio	12/07/2021	16/07/2021

INTERNAL TESTINGS PACKAGING EVO 100



PACKAGING 6J.0862.AN.8

REVIEW 0

PAGE 6 OF 13

- Wooden block: 1,2 x 0,01 x 0,6 m
- Number of falls: 1
- Impact border: 3-6
- Height of fall: 200mm



- Observation: Subsequently to the border fall test, the wooden angle at corner 5-2 showed separation



Completed by:	Date (tests)	Date (review)
Pietro Cunio	12/07/2021	16/07/2021

INTERNAL TESTINGS PACKAGING EVO 100



PACKAGING 6J.0862.AN.6

REVIEW 0

PAGE 8 OF 13



- Observation: Rotation of face 5 central support.



Completed by:	Date (tests)	Date (review)
Pietro Cunioo	12/07/2021	16/07/2021

INTERNAL TESTINGS PACKAGING EVO 100



PACKAGING 6J.0862.AN.6

REVIEW 0

PAGE 10 OF 13



- > Rotation on its axis of face 6 central support



Completed by:	Date (tests)	Date (review)
Pietro Cunioo	12/07/2021	18/07/2021

INTERNAL TESTINGS PACKAGING EVO 100



PACKAGING 6J.0862.AN.6

REVIEW 0

PAGE 13 OF 13

Evaluation post tests



Completed by:	Date (tests)	Date (review)
Pietro Cunio	12/07/2021	16/07/2021

INTERNAL TESTINGS PACKAGING EVO 100



PACKAGING 6J.0862.AN.6




REVIEW 0



PAGE 14 OF 13

The 6J.0862.AN.6 packaging sample was tested, at first, according to the ISTA 3B - Palletized or Skidded standard internally at the TK Elevator's Guabá/RS - Brasil plant. It wasn't possible to perform all the mandatory tests for lack of adequate equipment, so the current document represents an introductory evaluation for the certification.

It is possible to notice, by visual assessment, that the supports which directly brace the packaging weight at faces 5 and 6 show rotation around their axis, causing a misalignment with each other. The corner 5-2 angle shows disunity of the rest of the package from its fixing elements, in other words, there wasn't rupture of material, but a detachment between the supports and the structure.

7.3 Packaging Defect Examples

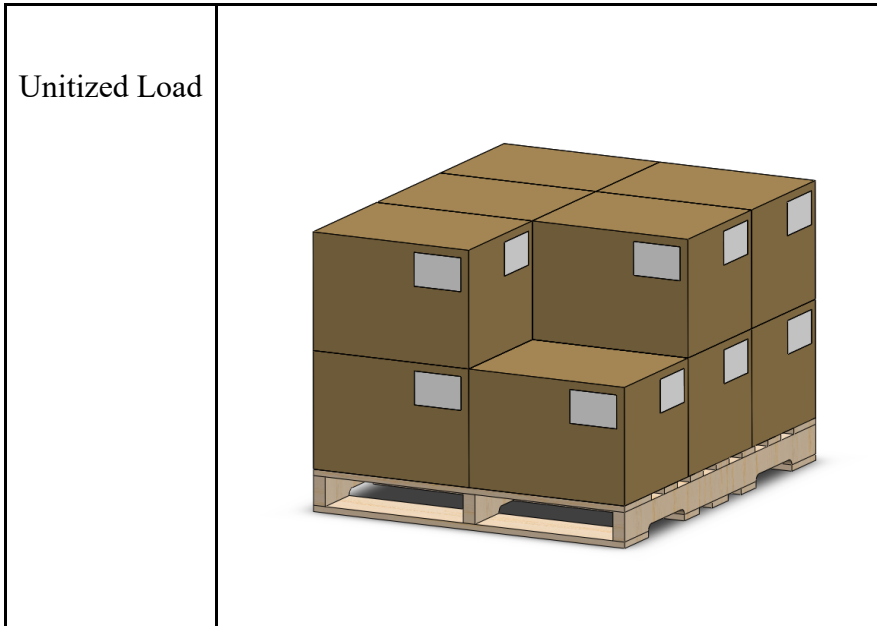
Unit load/form factor	Mode of failure	Example
Stringer pallet	Stringer splitting	
Corrugated container	Corrugated puncture	
Corrugated container	Corrugated crushing	

<p>Plastic pail</p>	<p>Pail cracking</p>	
<p>Pallet</p>	<p>Damaged pallet</p>	

7.4 Label Placement Guide

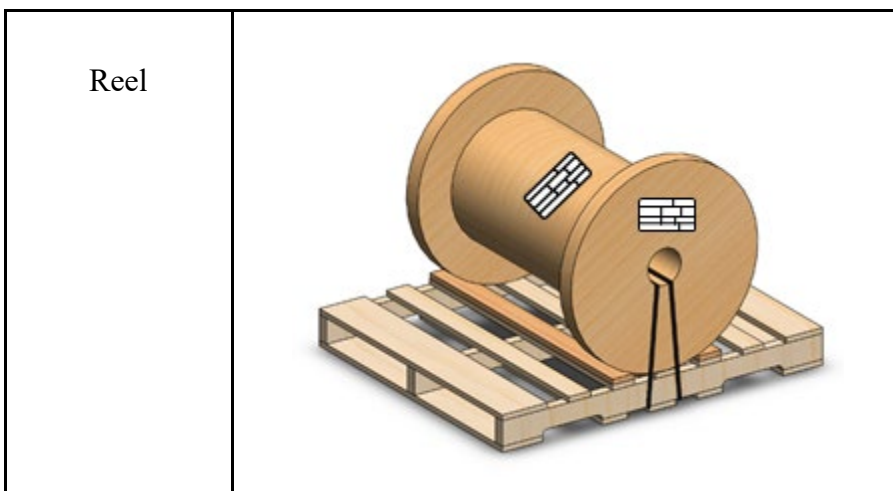
The label placement guide demonstrates proper label placement locations based on the size, shape, and geometry of a part, product, or unit load. For detailed labeling information, refer back to the [Labeling and Documentation](#) section.


Bundles




Unitized Load - Labels placed on two sides that are perpendicular to each other except for the bottom and top sides

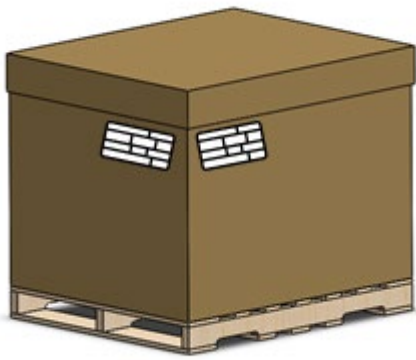
Rolled goods





Tubes	
	Tubes - Labels placed on the end and along the shaft



Boxed goods

Box	
-----	---

<p>Bulk Bin</p>	
-----------------	---

Other





<p>Bag</p>	
<p>Drum</p>	




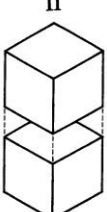












<p>Pail</p>	
<p>Crate</p>	



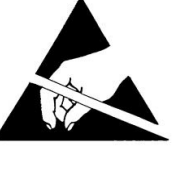






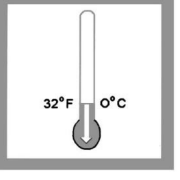
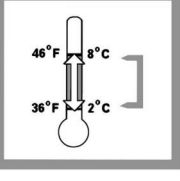

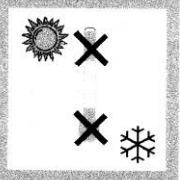



Crate - Labels placed on two sides that are perpendicular to each other except for the bottom and top sides

7.5 Additional Icons List

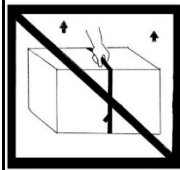
Icon examples per ASTM D5445 and ISO 780:

<p>Center of balance</p>		<p>Top heavy</p>	
<p>Do not roll</p>		<p>Use no hooks</p>	

<p>Do not use this lift truck for handling</p>		<p>Keep away from heat</p>	
<p>Keep away from cold</p>		<p>Stacking limitation by number</p>	
<p>Sling here</p>		<p>Stacking limitation by weight</p>	
<p>Do not stack</p>		<p>No hand trucks here</p>	
<p>Temperature limits</p>		<p>Do not use this lift truck for handling</p>	
<p>Do not use this lift truck for handling</p>		<p>Use this handling device</p>	
<p>Use this handling device</p>		<p>Use this handling device</p>	
<p>Use this handling device</p>		<p>Clamp here</p>	

Lift goods directly (inner fastening)		Do not clamp here	
Content electrostatic sensitive		Do not break bulk (depalletize)	
Do not drop		Do not stack two on fork lift	
Do not step here		Do not freeze	
Magnetically sensitive		Keep frozen	
Keep refrigerated		Avoid heat	
Avoid extreme temperatures		Floor load only	
Air eligible		Not air eligible	

Do not use strapping to move (lift or pull) packages



Do not use strapping to move (lift or pull) unitized loads

