



**Global Packaging
and
Shipping Guidelines**

REVISION HISTORY

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FOREWORD

Prepared by the Magna Packaging Steering Committee in cooperation with Logistics, Packaging Engineering, Industrial Engineering, Production Control and Global Supply Chain Management. These guidelines provide minimum requirements and recommendations for packaging and shipping products into Magna Plants.

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1. INTRODUCTION

As an integral part of the Magna Global Supply Chain Requirements, the Magna Global Packaging and Shipping Guidelines outlines the packaging & shipping recommendations for material being shipped to Magna Plants throughout the world. The minimum requirements and recommendations in this document are considered an addendum to Magna Purchasing Terms & Conditions. Unless otherwise agreed in writing and in case of any conflict between this document and Magna's Purchasing Terms & Conditions, the Purchasing Terms & Conditions shall take precedence.

The intent of these guidelines is to ensure safe movement, part quality, freight cube optimization, lean implementation, and control of total costs. The responsibility for ensuring quality of material shipped remains with the supplier throughout the material movement process. Compliance to all local regulations is required.

The following are minimum requirements and recommendations that a supplier must consider in both the development of a packaging plan and the application of shipping requirements. Upgraded standards may be required for your specific applications. Additionally, these guidelines may be modified by supplemental requirements of the receiving Magna Plant. The use of these guidelines or approvals of the Magna Supplier Packaging Information (SPI) form does not relieve the supplier of responsibility for part quality. The Supplier Packaging Information (SPI) form used in these guidelines, includes group-specific or plant-specific forms such as Packaging Data Sheet (PDS), Packaging Declaration Form (PDF), Packaging Specification Proposal (PSP), etc. These guidelines should be applied to all production parts prior to quote submission. The Magna's Plant Packaging Leader (PPL) must approve all exceptions.

It is expected that each supplier will develop their packaging plan employing all recommendations within the Magna Global Packaging and Shipping Guidelines and all packaging changes must be managed through each Magna Plant PPL. As it is the supplier's responsibility to ensure part quality from their plant to the point of use, should part quality be compromised, in any manner, the supplier may be held liable for repacking, inspection and incremental freight costs. As well, it is expected that each supplier will assure all their affected employees are knowledgeable and capable of compliance.

Goals:

1. All parts received with superior part quality.
2. Parts presented with operator ergonomics and work cell efficiency considered.
3. Achieve maximum pack density while minimizing costs.
4. Maximize the use of recyclable materials while minimize disposal of materials to landfill.
5. All parts received are to follow the size recommendations as specified in the Magna Standard Container Menu (See Attachment A1-A5).
6. Facilitate the maximum utilization of the cubic shipping footprint.
7. All solid wood packaging must meet ISPM15 requirements.

2. PACKAGING DEVELOPMENT & APPROVAL

Magna Responsibilities

- Define the preferred packaging system (expendable/returnable).
- Approve the packaging plan utilizing the Supplier Packaging Information (SPI) process.
- Assist the supplier with the packaging plan as required.
- Determine system size, quantity, and allocation of returnable containers. Monitor and assure compliance to Magna requirements.

Supplier Responsibilities

- Review this document to ensure all minimum requirements and recommendations are clearly understood and met.
- Discuss with your Magna PPL any specific requirements of the receiving Magna Plant.
- Ensure that pack validation can be completed by program start up dates.
- Returnable packaging designed, owned, and provided by the supplier must be approved by the appropriate Magna PPL before shipments commence. The supplier's name and the container identification must be clearly visible on each returnable container.
- Submit a completed SPI form to Plant Purchasing Manager (PPM) with all part quote submissions.
- Resubmit SPI form with all proposed packaging changes.
- When requested, provide for approval sample production intent packaging with parts.
- Design a back-up expendable system when a returnable system is used (of same size and equal to returnable standard pack quantity) which may be required for premium shipments, production run ahead programs, returnable container outages, etc. Plan and maintain sufficient supply of suitable expendable packaging. Alternate pricing for expendable packaging costs must be prearranged with PPM.
- Designing their own expendable packaging including the expendable packaging for the primary container, expendable dunnage used within expendable and returnable containers, and expendable back-up packaging for returnable container systems.
- Monitor governmental & industry regulations to ensure their packaging conforms to all applicable requirements.
- Ship all production intent parts in production intent packaging.

3. GENERAL REQUIREMENTS

3.1 PRICING

Packaging costs must be included in all part quotations and clearly defined in the piece price.

- SPI form must be submitted to Magna Purchasing or designate.
- All packaging pricing must be negotiated with the PPM.
- No price increases will be granted to correct defective and/or non-conforming packaging.
- Pricing of returnable systems must be cost justified considering system size requirements, freight, housekeeping and lean material handling/processing costs.
- Magna will not pay for additional containers to support supplier buffers.
- Note at time of quote, any plans to reuse or reconstruct returnable system items (pallets, dunnage, etc.).

3.2 DESIGN

Packaging Systems:

- The static stacked load (when full) must have the strength to stack to a height of 13.1 feet (4.0 m).
- Magna's modular packaging system will facilitate the maximum utilization of the cubic shipping footprint, in-plant storage and point-of-use presentation. This system is based on these modular standards:
 - North American Standards
 - Maximum unit load height (containers plus pallet) must not exceed 52 in. (1320 mm)
 - Shipments must conform to the 48 in. x 45 in. (1219 mm x 1143 mm) footprint specifically designed for a standard 53' trailer.
 - Sea Container Standards
 - Maximum unit load height (containers plus pallet) must not exceed 1120 mm (44 in.) or 1200mm for 40' high cube.
 - Shipments must conform 1140 mm x 980 mm (44.9 in. x 38.6 in.) footprint specifically designed for a standard 20', 40', or 40' high cube shipping container.
 - European Standards
 - Shipments must conform to Industrial module 1200 mm x 1000 mm (47.2 in. x 39.4 in.) or Euro module 1200 m x 800 mm (47.2 in x 31.5 in) footprint.
 - Asia Standards
 - Shipments must conform to Industrial module 1200 mm x 1000 mm (47.2 in. x 39.4 in.) or Euro module 1200 m x 800 mm (47.2 in x 31.5 in) footprint.
- Reference container menus are provided on Attachment A1-A5 of this document.
- Package design and standard pack quantity (pieces per container) shall not vary except when approved by Magna.

- Suppliers are responsible for designing their own expendable packaging. This includes the expendable packaging for the primary container, expendable dunnage used within expendable and returnable containers, and expendable back-up packaging for returnable container systems.
- Suppliers may receive assistance from the packaging suppliers and/or from Magna. This does not relieve them of their responsibility to provide quality part.
- When a returnable container system is required by Magna, suppliers are responsible to provide a design that meets all Magna requirements, while ensuring part integrity during shipment.
- If there are specialized design requirements, Magna may choose to assume responsibility for the packaging design.

3.3 PACKAGING AGREEMENT SUBMISSION

The Magna SPI form represents an agreement between Magna and the Supplier regarding the packaging plan for products received by Magna Plant-

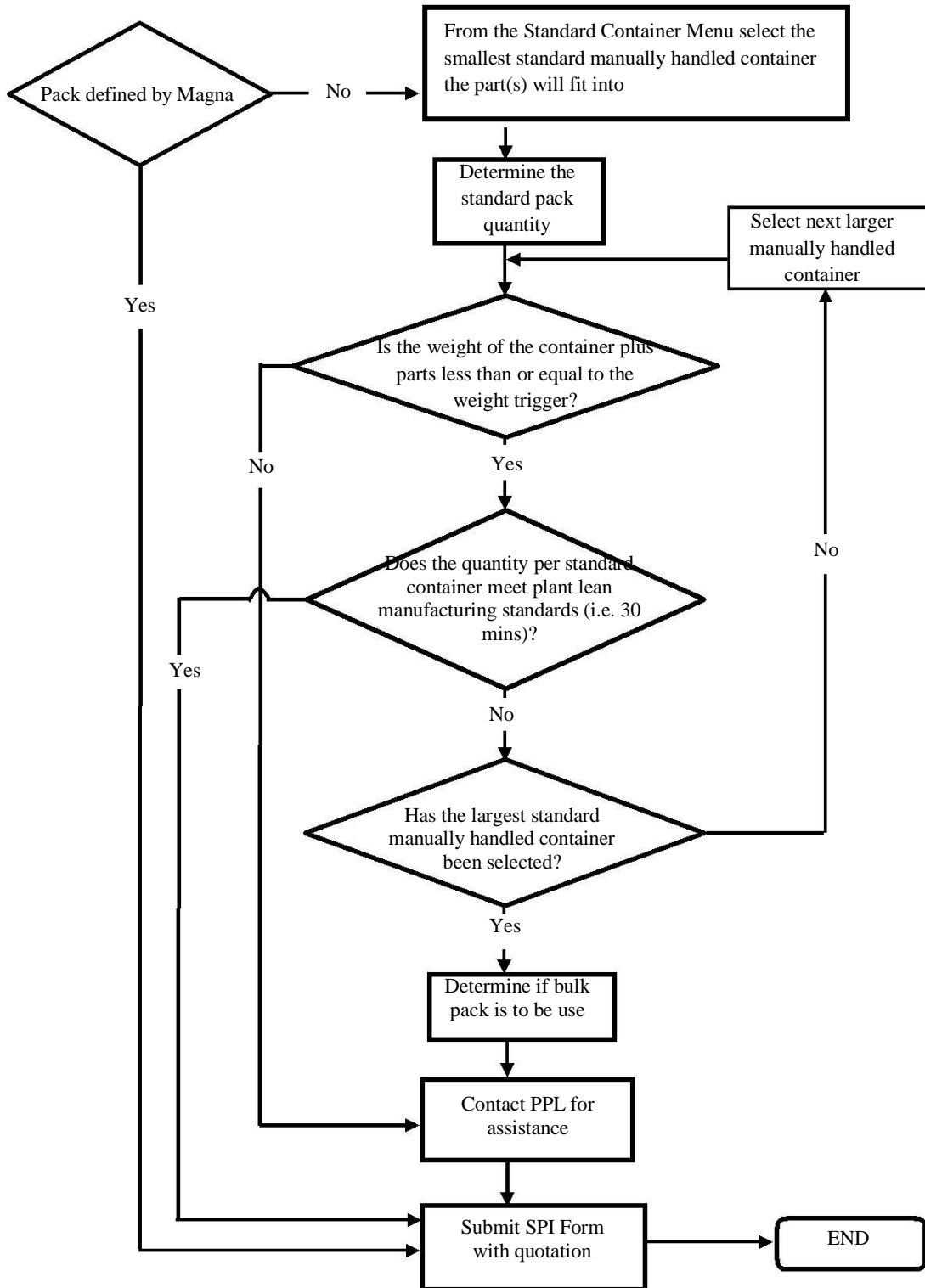
- For all quotations, suppliers must submit an SPI form for each part number.
- Changes to part number, quantities, packaging materials or dimensions require a re-submittal of the SPI form.
- All exceptions or deviations to Magna's Standard Container Menus must be approved by the appropriate Magna PPL. Approvals of the Magna SPI form in no way relieves the supplier of responsibility for part quality.
- Each Magna Plant may utilize their specific SPI form tailored to their needs or as part of their PPAP process. Contact individual Magna Plant PPL for the acceptable SPI form.

3.4 CHOOSING THE RIGHT CONTAINER

If a specific container requirement has not been indicated in the request for quote, use the Decision Process for Container Rightsizing (3.5 DECISION PROCESS FOR CONTAINER RIGHT-SIZING) to select the container. This rightsizing model along with the Standard Container Menus (See Attachments A1 – A5) ensure the best rightsized container is chosen to optimize the entire material flow process from supplier through Magna plants. All Containers shipped to Magna Plants must consider the recommendations from the Magna Standard Container Menus or approval for exceptions must be given by the receiving Magna Plant. These menus represent the recommended container sizes, both for expendable and returnable cartons/containers, approved by Magna. However, when product dimensions dictate, an alternate container size will be permitted. Exceptions to the Standard Container Menu must be pre-approved.

Suppliers must document selected container plans by completing the SPI form.

3.5 DECISION PROCESS FOR CONTAINER RIGHT-SIZING



3.6 ERGONOMIC REQUIREMENTS

Packaging has a large impact on ergonomics in Magna’s Plant, but different types of packaging have different advantages.

Weight: The maximum acceptable weight of a manually handled container depends upon the size of the container in addition to workplace and human factors. The weight triggers below assume a well laid out workplace with typical handling frequencies. If conditions are expected to be compromised or unusual, a NIOSH assessment should be completed to determine a more appropriate target (e.g. high frequency tasks, long carries/reaches due to unusual cell layouts, unstable loads, particularly high or low hand heights when handling containers etc.).

If the weight of the loaded container is greater than the Weight Trigger in the table below, make sure that the smallest feasible container size has been selected, or reduce the quantity of parts in the container to reduce the weight below the Weight Trigger.

If this is not possible, additional ergonomic analysis will need to be done to determine if the loaded container weight is acceptable. This considers the specific conditions in which the manually handled container will be used in the Magna Plant.

When a Weight Trigger has been exceeded, approval to use the container is needed from Magna PPL.

Weight Triggers for Standard Sizes

Container Size		Typical Weight Trigger	
INCHES (L x W x H)	MILIMETER (L x W x H)	Weight Trigger (lb.)	Weight Trigger (kg)
12 x 7 x 5	305 x 191 x 127	35	15
12 x 15 x 7	305 x 381 x 178	28	11.8
24 x 15 x 7	610 x 381 x 178	28	11.8
24 x 22 x 11	610 x 572 x 280	21	9.5

Weight Triggers for other containers (plus parts) in the Magna Standard Container lists may be calculated using the following formula:

$$\text{Weight Trigger (English)} = \frac{410 \text{ in-lbs.}}{(0.5 * \text{container width (inches)} + 8 \text{ inches})}$$

$$\text{Weight Trigger (Metric)} = \frac{468.6 \text{ cm kg}}{(0.5 * \text{container width (cm)} + 20.3 \text{ cm})}$$

Any manually handled container not listed in the Magna Standard Container Menu is considered non-standard. Handling of non-standard containers may be ergonomically acceptable if the weight of the loaded container does not exceed its calculated Weight Trigger.

Other Factors to Consider for all containers:

- If handholds are required, apply the following:
 - Select the appropriate type of handhold for the container such as: hinged access holes for expendable containers; D-shaped and molded handles for returnable containers.
 - Properly dimension handholds to accommodate gloved hands.
 - Position handholds above the center of gravity.
- Containers should be rigid and not allow excessive flexing, bowing, buckling or distortion.
- There should be no sharp or protruding edges/ridges.
- The following dunnage designs should be considered:
 - Part-orientation within container should match the part orientation used by operator.
 - Allow access space for fingers/hand during part placement and removal.
 - Minimize the force required for part placement/removal.

3.7 TESTING AND VALIDATION

Packaging testing is the most efficient means of ensuring the integrity and safety of contents and performance of the pack. It is the suppliers' responsibility to ensure part integrity during transportation and subsequent handling and storage through point of use. The supplier should test the pack design under simulated and/or real-life conditions. Validation results must be available upon request when submitting Magna SPI form. The approval by Magna of the packaging system does not relieve the suppliers of their responsibility for part quality.

Testing and Validation References

- ASTM (American Society for Testing and Materials)
- ISTA (International Safe Transit Association)
- VDA (Verband der Automobilindustrie)

3.8 HAZARDOUS MATERIALS & ADDITIVES

The supplier is responsible for assuring shipment of hazardous materials are compliant with all government regulations or any other relevant international, federal, state, provincial or local requirement.

The supplier is responsible for informing Magna of any packaging that contains materials that may render the packaging "hazardous" as defined by the laws of the country or countries where the packaging is to be used. This information should be in the form of a notification to Magna's Buyer that includes the Magna Part Number and the hazardous constituent of concern that is incorporated in the packaging. Approval for the transfer of ownership to the using plant of hazardous packaging will require the approval of the plant environmental engineering based on the availability of suitable and economical disposal.

The shipping and receiving location's hazardous material decision authority and/or PPL must approve any additives (i.e. corrosion inhibitors) on the parts or within the package to determine environment and production impacts. Any corrosion inhibiting measure must be compatible with mating assemblies if the additive is to remain on the part. Compatibility will be determined by Magna prior to the supplier shipping the first production intended materials.

The supplier is required to provide "Material Safety Data Sheets" to the transporter of the material as well as the shipping and receiving location.

4. EXPENDABLE PACKAGING SYSTEMS

4.1 PALLET SIZE AND CONSTRUCTION

Size: Magna standard footprints are governed by the size and cube of transporting conveyance. Non-standard pallets require approval.

North American Standards: A 48 in. (1219 mm) x 45 in. (1143 mm) x 5 in. (127 mm) pallet has , 48 in. (1219 mm) stringers, 45 in. (1143 mm) deck boards and the top of the deck is 5 in. (127 mm) above the floor. For the four –way entry pallet, the primary (easy entry) opening is across the 45 in. (1143 mm) width.

Non-reversible four-way entry stringer wood pallets, with 3.5 in. (89 mm) minimum primary opening height are required. Two-way entry may be used on 32 in. (812 mm) x 30 in. (762 mm) pallets.

Sea Container Standards: An 1140 mm (44.9 in) x 980 mm (38.6 in) x 145 mm (5.7 in) pallet has 980 mm (38.6 in) stringers, 1140 mm (44.9 in) deck boards and the top of the deck is 145 mm (5.7 in) above the floor. For the four –way entry pallet, the primary (easy entry) opening is across the 1140 mm (44.9 in) width.

Non-reversible four-way entry stringer construction wood pallets, with 89 mm (3.5 in) minimum primary opening height are required.

European and Asia Standards: Euro module 1200 mm (47.2 in.) x 800 mm (31.5 in.) x 144 mm (5.7 in.) pallet.

Industrial module 1200 mm (47.2 in.) x 1000 mm (39.4 in.) x 144 mm (5.7 in.) pallet.

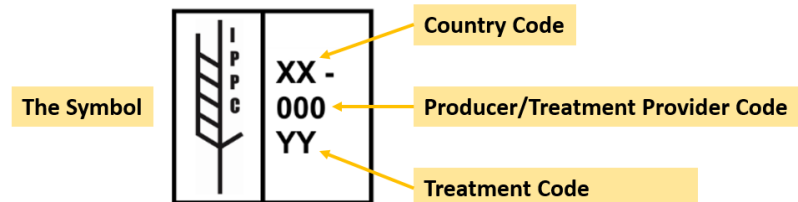
Non-reversible four-way entry stringer construction wood pallets, with 100 mm (3.9 in.) minimum primary opening height are required. Two-way entry may be used on 800 mm (31.5 in.) x 600 mm (23.6 in.) pallets.

Construction: The pallet must have the minimum strength to withstand the static and dynamic forces foreseen for the distribution environment. Pallet design criteria must be incorporated to prevent pallet deformations, damages and structural failures which detrimentally affect the functionality of the unit load. Refer to ASTM D1185 designation – Standard Test Methods for Pallets and Related Structures Employed in Materials Handling and Shipping – for testing details and pallet acceptance criteria. Additional requirements that will apply are as follows:

- Wood Pallets

- Nailed construction is required. Minimum 2 ¼ in (57mm) long, four-flute helical hardened nails are recommended.
- Deck boards should be spaced close enough to provide adequate support to the product and prevent the product from falling through.
- The pallet must have the strength to stack in storage (when full) to a height of 13.1 feet (4.0 m).
- Structural members of the pallet should be compatible with the carton by supporting the edge and corners.
- All pallets must comply with ISPM#15 regarding non-manufactured wood products (NMWP) regardless of country origin or destination. These requirements provide guidance on the treatment and marking of coniferous and non-coniferous wooden packaging products. For information regarding the international guidelines: International Phytosanitary Portal [IPP] at <https://www.ippc.int/>
- Pallets may be new, reconditioned or reconstructed. However, reconditioned or reconstructed pallets must be retreated and show markings that indicate conformance to ISPM #15.
- Treated wood packaging material must bear an ISPM (International Standards for Phytosanitary Measures) 15 mark – See Figure 1

- Figure 1: ISPM #15 Marking

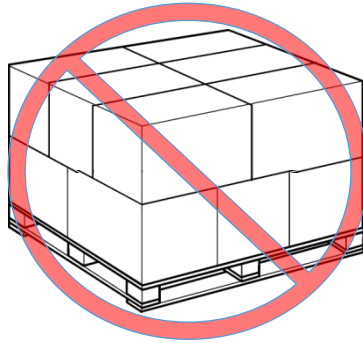


- Identification of manufacturer and / or pallet name printed on a visible pallet stringer is required.
 - Nail heads and points are to be flush and may not exceed 1/8 in (3 mm) exposure from surface.
 - No missing or broken deck boards top or bottom.
 - No tapered breaks greater than 1 in. (25 mm) or longer than 10 in. (254 mm) in length.
 - All stringers must be solid, not broken or have cracks visible from 3 sides or longer than 1 in. (25 mm); weathering cracks allowable if meet above standards.
 - No double stringers, patched boards or metal plates.
 - No partial footing where stringer is ¼ in. (6 mm) missing or deck nail shanks are exposed.
 - No exposed splinters greater than 3 in. (76 mm).
 - Pallets must be clean and odor free. Aging discoloration is acceptable.
- Preferred Wood stringer Pallet “Automotive NA 48 x 45 Wood Stringer Pallet Specification” for North America
 - <https://www.supplierspartnership.org/48x45-stringer/>

4.2 CONTAINER DESIGN AND CONSTRUCTION

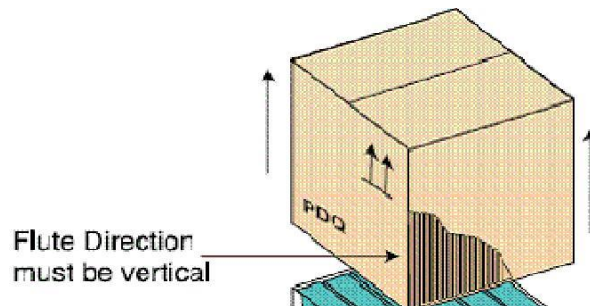
The expendable container system has been designed to be modular. All material must be shipped in box sizes shown in the Magna Standard Container Menu. This allows for effective layering and utilization of the standard pallet dimensions. Any deviation to using the Magna Standard Container Menu requires prior authorization by Magna's PPL via SPI form approval prior to shipment of the material. The following are expected when creating a load of material:

- Containers must be palletized to ensure part protection and to permit handling with industrial trucks when sufficient quantities are to be shipped.
- Brick stacking is prohibited due to loss in compression strength.

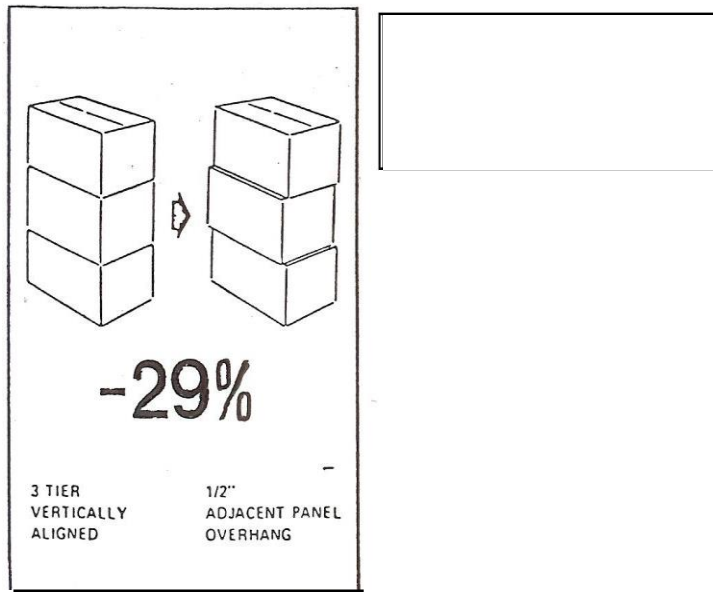


Brick stacking is prohibited.

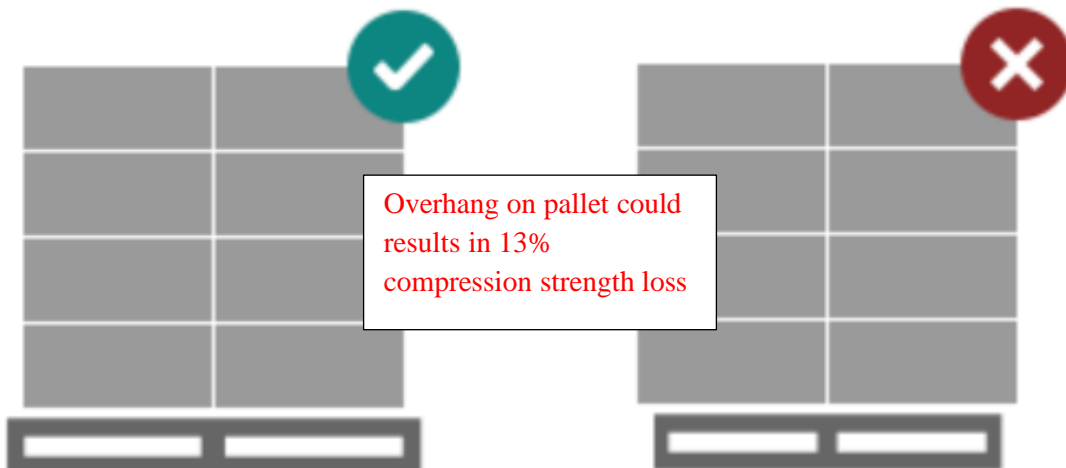
- Flute direction must be vertical (corrugated pattern in wall of carton must have visible spaces in the vertical direction) to optimize compression strength of the carton.



- Containers must be aligned and fully utilize the length and width of the pallet due to compression strength loss.



- Containers must not overhang the pallet.



<http://www.uship.com/ultimate-freight-guide>

S. Paul Singh. (2011). Retention Factors for Compression Strength of Corrugated Fibre Board Boxes [PowerPoint slides]. Tampa, Florida

Half Slotted Containers (HSC) are required and Regular Slotted Containers (RSC) may be used with prior Magna approval (see Attachment A1 – A5).

- When HSCs are used, one common cover over each full layer of cartons on a pallet is the preferred method; although in some cases individual lids may be required.
 - The use of uncovered (uncapped) HSCs is not acceptable.
- Corrugated material in shipping containers must have adequate strength to allow the parts to arrive at the destination location in the same quality condition in which they were manufactured.
- A minimum 44 ECT/7.7kN/m (edge crush test) is required.
- Parts plus dunnage should completely fill the container to prevent collapsing because of excessive voids.
- Any specialized packaging material such as lamination or multilayered material(s) must have prior authorization.
- All containers must be constructed with an outside tab style manufacturer's joint. A stitched manufacturer's joint is required if a glued or other type joint proves inadequate.
- All containers must have a box maker's certificate visible on the assembled container displaying edge crush (ECT) or bursting strength.
- The use of scored drop sides on palletized cartons may be required. Although normally on the longer side of the container, the location and size of the drop side is determined by part orientation and operator ergonomics. Consult your Magna PPL if further clarification is required.
- Wire bound wood pallet boxes or wood crates are not acceptable.
- Prior approval is required to use wood composite crates.
- Expendable container systems based on paper products, paperboard, fiberboard or similar materials must be designed to withstand an environmental atmosphere of 40°+/-2°C (104°+/-4°F) with an 85 +/- 5% relative humidity. Suggested pre-condition environment considers a temperature of 23°+/-1°C (73°+/-2°F) with a 50 +/- 2% relative humidity. Refer to ASTM D685 designation – Standard Practice for Conditioning Paper and Paper Products for Testing – and ASTM D4332 designation – Standard Practice for Conditioning Containers, Packages or Packing Components for Testing or ISO2233 Packaging – Complete, filled transport packages and unit loads – Conditioning for Testing – for additional details.
- Any other expendable container system must be designed to withstand temperature variations from -29°C to +60°C [(-)20°F to (+)140°F] with relative humidity variations up to 85 +/- 5%. Refer to ASTM D4332 – Standard Practice for Conditioning Containers, Packages or Packaging Components for Testing or ISO2233 Packaging – Complete, filled transport packages and unit loads – Conditioning for Testing – for details on environmental considerations.

4.3 CONTAINER CLOSURE

Closure refers to the method in which containers must be sealed, after being filled, for shipping and handling. Containers must be adequately sealed to assure they do not open during shipping or handling. Taping or gluing is accepted for bottom closure. Avoid staples for container closure. Packaging materials containing asphalt, such as asphalt sealing tapes are prohibited.

If any specific tool or methodology is required to open the container, it is mandatory to gain prior Magna approval.

4.4 CONTAINER SECUREMENT (UNITIZATION)

All expendable containers shipped on pallets must be adequately secured to the pallets. Nails, screws, metal staples, metal strapping, metal clips or banding buckles, glue or PVC film to secure loads to pallets are prohibited.

The following are acceptable methods for securing cartons to a pallet:

- Plastic (Non-Metallic) Strapping
 - A minimum of two vertical bands lengthwise and two vertical bands widthwise must be used for handheld container load.
 - A minimum of two vertical bands widthwise must be used for bulk container load.
 - Horizontal banding of corrugated boxes is prohibited without the use of corner supports.
 - Polypropylene strapping is the preferred strapping material.
 - Non-metallic strapping must be joined with a friction seal.
 - Metal clips or buckles are prohibited.
 - Metal strapping is prohibited.
 - Suitable non-stapled corner and edge supports are permitted.
 - Magna's PPL must approve the use of any other strapping material or configuration.

- Stretch film
 - Stretch film must be linear low-density polyethylene (LLDPE) and clear in color. Stretch film must have enough clarity to enable bar code scanning of labels.
 - PVC film is not permitted.
 - A minimum of three layers of stretch film, or the equivalent in performance, are required around and encompassing the pallet. Stretch film must securely capture the pallet when wrapping the bottom layer.

4.5 SYSTEM PERFORMANCE CHARACTERISTICS

- Maximum load heights (containers plus pallet) should not exceed 52 in. (1320 mm) for North America and 1120 mm (44 in.) for International Sea Container shipments.
- All packs must be level layered. No pyramid stacking of cartons is allowed.
- The stacked load must have the strength to stack (when full) in storage to a height of 13.1 feet (4.0 m).
- The use of DO NOT STACK labels and cones will not exempt the supplier from over, short or damaged product claims and will be grounds for a Problem Report.
- Maximum weight of any load (containers plus pallet) is 2200 pounds (1000 kg).
- Container designs must provide for dynamic (in transit) loading of three times the static (in storage) load and must have sufficient strength to stack to a height of 104 in. (2640 mm) in a trailer. Suitable non-stapled corner supports and top stacking frames may be necessary to meet this requirement.
- All container designs must be stackable.
- Air freight shipments, LTL (less than truckload), or other special shipments are subject to abnormal handling and require more substantial packaging.

4.6 UNNACCEPTABLE DESIGN CHARACTERISTICS

- Pyramid stacking of containers disallowing load stacking.
- Misalignment of containers causing crushing.
- Overweight containers.
- Insufficient container strength to protect components.
- Multiple footprints disallowing standard loading patterns.

4.7 EXPORT / IMPORT REQUIREMENTS

Below are the general requirements to follow when shipping parts from one country to another country:

- Supplier will monitor governmental & automotive industry regulations for changes related to packaging & shipping information.
- All export packaging must meet global shipping material requirements. including, without limitation, verification of whether packaging contains SVHC (Substance of Very High Concern) under REACH.
 - <https://www.gadsl.org/>
 - <https://echa.europa.eu/home>
- When shipping by airfreight, special reinforced packaging may be necessary.
- Packaging materials shall protect part quality for a minimum of 30 days for Intra-continent shipments and minimum of 90 days for Inter-continent shipments.

5. RETURNABLE PACKAGING SYSTEMS

A returnable container has a design and function permitting it to be used more than once in a defined supplier-customer system. All returnable containers shall include a cardholder and/or a label placard.

5.1 MAINTENANCE, REPAIR AND CLEANING

Magna Responsibilities

- The Magna plant, when shipping empty containers, will assure the containers are free of debris and expendable packaging materials.
- Any maintenance and repair must be reviewed for Magna owned systems.

Supplier Responsibilities

- Clean returnable containers, including residue, and expendable dunnage, when required. Routine checks should be made and regular cleaning should occur as needed to ensure part quality and cleanliness during the life of the container.
- Load/ship production parts in clean undamaged containers only and load the container systems into the transportation equipment in a manner that maintains part quality.
- Contact receiving plant's Materials Manager (or designate) for repair if a damaged container or pallet is detected.
- Remove damaged unit immediately from the system then tag as damaged and send pictures and quantity to plant's material manager (or designated) for disposition.
- Remove all one-time shipment labels on returnable packaging.
- Suppliers shall store containers in a manner, which allows ease of inventories, maintains cleanliness and protects containers from excessive environmental exposure.

5.2 RETURNABLE PACKAGING OWNERSHIP

Magna Responsibilities

- Fleet management of Magna owned returnable container systems.
- Coordinate any economic feasibility study to assure acceptable return on investment (either Magna owned or Supplier funded and piece price recovery).
- Provide recommended returnable system.
- Approve system size and returnable system proposals.
- Provide disposition of obsolete/damaged containers.
- Provide instructions to container manufacturers on proper marking of the returnable containers and required documents in support of Customs special trade or tariff reduction programs. Returnable containers should include the markings "Container made in (country)" and a unique identifier such as the container number.
- Communicate and facilitate the use of container asset tracking of Magna owned container system(s).

Supplier Responsibilities

- Support, as required, Magna in managing Magna owned returnable container systems (i.e. inventories, container tracking system).
- Magna returnable containers are to be used only for shipment of Magna products, returnable containers cannot be used for the supplier's internal WIP storage or for any special bank builds in support of engineering changes if it will affect normal part flow in returnable containers and are to be maintained in good order.
- Under no circumstances will damaged packaging be used for shipments to Magna Plants.
- Assure accurate container identification and quantities (including pallets, returnable dunnage and containers) for the intended Magna plant.
- Do not mix Magna packaging between different Magna plants or Supplier owned Returnable packaging.
 - Prior Magna approval required as part Magna container pooling system.
- Do not ship Magna parts using Supplier Owned Returnable packaging. Magna is not responsible for loss of Supplier Owned Returnable Packaging.
- Maintain continuous shipping and receipt records of all Magna owned returnable packaging including:
 - Outbound shipments by container and location.
 - Supplier in-plant reserve.
 - Balance not returned from each Magna receiving location.

- Inspect all containers upon return and tag, document & report any damaged containers to Magna's Plant Materials Manager (or designate) including pictures and quantity by container type.
- Contact Magna's Plant Materials Manager (or designate) if shortages occur.

6. INTERNAL DUNNAGE

Internal dunnage is considered to be a packaging component that requires a pallet or container to be shippable (e.g. vacuum formed trays, corrugated partitions, layer pads, etc.). Dunnage can be used in both returnable and/or expendable systems. Dunnage shall be used when part-to-part contact must be eliminated to prevent damage in shipping and handling or in cases where special part orientation as provided in your quote package is requested. Suppliers are responsible for the design and performance of expendable and returnable dunnage via the SPI approval process. Procurement of expendable internal dunnage resides with the supplier while procurement of Magna-owned returnable internal dunnage resides with Magna. Container loading, unloading, and waste recycling / disposal must be considered when designing interior dunnage. The use of dunnage constructed of combined and / or non-recyclable materials is discouraged.

7. SHIPPING LABELS

Below are the general requirements to follow when labeling:

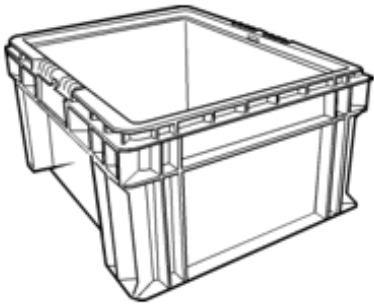
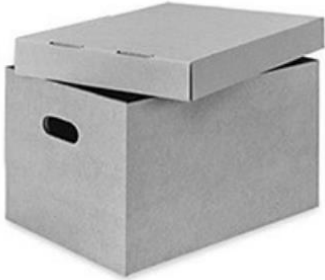
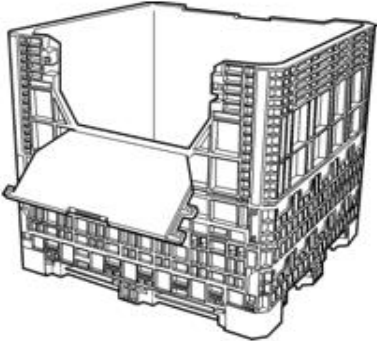
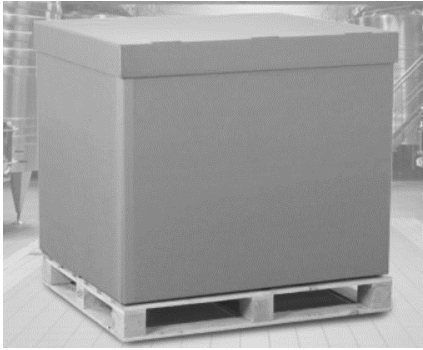
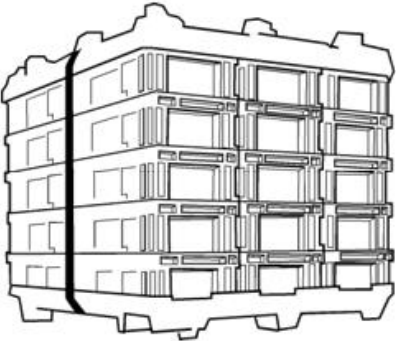

- Review the label standards from Magna Global Supply Chain Requirements located on the Supplier Portal.
- Ensure correct labeling is provided for all packaging.
- Labels must be legible.
- All labels must be electronic scanner compliant.
- If placards are available on containers, use this area to apply shipping labels.
- Any deviations must be reviewed and approved by the receiving Magna's Plant Materials Manager.
- Where container size does not adequately provide for the use of standard shipping labels, contact the Magna's Plant Materials Manager.

8. MIXED LOADS

A mixed load occurs when more than one part number is shipped on a pallet. (Note: Loads should never be mixed in a bulk container system.) A mixed load should be considered mainstream when frequency of delivery requires less than full pallet loads. This also allows better cube utilization of the transportation system. When shipping a mixed load, the following requirements must be met:

- The mixing of containers on a single skid destined for different plants or delivery docks is prohibited.
- A mixed load label must be affixed to the load on two adjacent corners where the shipping label is normally attached. In addition, a mixed load manifest or packing slip must be attached to the load that indicates the part numbers shipped and how many containers are associated with each part number.
- The packing slip will designate the entire contents of the load.
- Similar part numbers will be grouped together on the pallet for ease of identification and accountability.
- The containers must be positioned on the pallet so the label faces the outside perimeter of the pallet for ease of identification. When possible, all labels should be visible to ease identification and accountability requirements.
- Care should be taken to balance the load by distributing the weight as evenly as possible, remembering that similar products must be grouped.
- The load may require special attention to secure the containers if void and or irregular configuration occurs. Stretch wrap is the preferred method.
- Level layers are the requirement. This allows better cube utilization of the transportation system. Mixed loads may be necessary to achieve this condition. A “mixed load” may have the following conditions:
 - Single or multiple part number(s) on a pallet mixed with empty containers.
 - Multiple part numbers on a pallet.
- Guidelines for mixing loads:
 - If the Magna receiving plant is ordering the material in layer quantities – mixed loads are not allowed unless receiving plant has authorized.
 - If the Magna receiving plant is ordering the material by box (carton) quantity – then mixing loads is permissible.
 - A MASTER label must be present on each pallet depicting all part numbers and part number quantities.
 - When mixing part numbers on a pallet, the heaviest parts must be placed on the bottom layer.

9. PACKAGING EXAMPLES

	
<p>MANUALLY HANDLED RETURNABLE</p>	<p>MANUALLY HANDLED EXPENDABLE</p>
	
<p>BULK RETURNABLE</p>	<p>BULK EXPENDABLE</p>
	
<p>PALLETIZED LOAD RETURNABLE</p>	<p>PALLETIZED LOAD EXPENDABLE</p>






10. RECYCLING INFORMATION

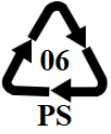



Resin Identification Codes

To facilitate the recycling of a product, its identity must be known. There are numerous types of plastics used for automotive packaging which require a simple method of identification. Magna will require the Resin Identification Codes; the same as on retail packaging. The resin identification code chart is shown below. All vacuum-formed and injection-molded plastic packaging material must be identified by this code.

NOTE: Plastic components that are assembled to the vehicle are to be identified with the proper resin identification code to facilitate recycling. Packaging material must be marked with the appropriate resin identification code.

RECYCLING NUMBER	ABBREVIATION	POLYMER NAME
	PETE or PET	Polyethylene Terephthalate
	HDPE or PEHD	High-density polyethylene
	PVC or V	Polyvinyl Chloride
	LDPE or PELD	Low-density polyethylene
	PP	Polypropylene

	<p>PS</p>	<p>Polystyrene</p>
	<p>OTHER OR O</p>	<p>Other plastics, such as acrylic, nylon, polycarbonate, and polylactic acid (a bioplastic), and multilayer combinations of different plastics</p>

 **WASTEFUL, EXCESSIVE, OR NON-RECYCLABLE MATERIAL**

Packaging is required to serve many needs; part protection, transportation effectiveness, lean manufacturing, and ergonomic and environmental concerns to name a few. Proposed and impending state and federal legislation is prohibiting wasteful and/or excessive packaging. The challenge is to meet these requirements with the amount and degree of packaging necessary and no more. Over-packaging, non-recyclable and wasteful “just-in-case” packaging is undesirable for both the supplier and the user. Each Magna supplier is expected to identify and correct such packaging on an ongoing basis.

**With reduction or elimination as the first priority,
the hierarchy of waste elimination is:
REDUCE →→→ REUSE →→→ RECYCLE**

To list every example of wasteful, excessive or non-recyclable packaging would be too extensive. We have identified a few examples that have been significant problems at the plants.

- Cartons partially filled.
- Oversized foam, plastic or corrugated dunnage.
- Expanded Polystyrene (EPS) foam or “Styrofoam”
- Micro cellular foam wrap and bubble wrap.
- Plastic protective covers, caps, plugs, paint masks or spacers required in the manufacturing process, but not required as a protective shipping device.
- Corrugated carton test strength that far exceeds requirements.

Viably recyclable packaging materials, which reduces packaging waste to landfill, provide positive economic and environmental impact. Corrugated plastic covered with fabric is a prime example of not viably recycled materials. The Sustainable Packaging Specification Recommendations for Automotive Manufacturing Operations provides guidance on packaging materials which are viably recyclable and preferred by Magna.

Sustainable Packaging Specification Recommendations for Automotive Manufacturing Operations

<https://www.supplierspartnership.org/sustainablepackaging/>

Plastic plugs, caps, and protectors are extremely difficult to recycle due to oil and paint contamination, colors, uncertainty of resin type, and transportation costs. Every effort should be made to eliminate the plastic. If it cannot be eliminated, other changes can be made to assist the plants' recycling efforts.

- Mold the appropriate plastic recycling code into the part. When elimination is not possible, these codes will allow for effective recycling.
- Clear LDPE plastics are preferred and can be effectively recycled.
- Ship plastics uncontaminated with paints and lubricants.
- Replace the plastic with a paper substitute.

Any plastic cap, plug, spacer, etc. not required for packaging or shipping protection must be removed prior to shipment.

11. FORMS AND SUPPLEMENT REQUIREMENTS

Attachment A1: Standard Container Menu: North American Standards – Expendable

Attachment A2: Standard Container Menu: North American Standards – Returnable

Attachment A3: Standard Container Menu: Sea Container Standards

Attachment A4: Standard Container Menu: European Standards

Attachment A5: Standard Container Menu: Asia Standards

References:

ASTM (American Society for Testing and Materials) - www.astm.org

ISTA (International Safe Transit Association) - www.ista.org

IPPC (International Plant Protection Convention) - www.ippc.int

PLASTICS (Plastics Industry Association), formerly SPI - www.plasticsindustry.org

NIOSH (The National Institute for Occupational Safety and Health) - www.cdc.gov/niosh

VDA (Verband der Automobilindustrie) - www.vda.de

AIAG (Automotive Industry Action Group) - www.aiag.org

Attachment A1 – Standard Container Menu: North American Standards

Expendable Manually Handled Containers

Outside Dimensions		Pallet Size		Containers per Layer
IN (L x W x H)	MM (L x W x H)	IN	MM	
Half Slotted Cartons (HSC)				
12 x 7 x 5	305 x 178 x 127	48 x 45	1219 x 1143	24
12 x 15 x 7	305 x 381 x 178	48 x 45	1219 x 1143	12
24 x 15 x 7	610 x 381 x 178	48 x 45	1219 x 1143	6
24 x 22 x 11	610 x 558 x 280	48 x 45	1219 x 1143	4
48 x 15 x 7	1219 x 381 x 178	48 x 45	1219 x 1143	3

Preferred Pallet Sizes	
IN	MM
48 x 45	1219 x 1143

Acceptable Pallet Sizes (Prior approval required)	
IN	MM
30 x 32	762 x 813

Expendable Bulk Container Size	
IN (L x W x H)	MM (L x W x H)
32 x 30 x 25	813 x 762 x 635
32 x 30 x 34	813 x 762 x 864
48 x 45 x 25	1219 x 1143 x 635
48 x 45 x 34	1219 x 1143 x 864

Note: These are right-sized expendable containers and all dimensions are outside dimensions.

Regular Slotted Cartons (RSC) require Magna approval.

Attachment A2 – Standard Container Menu: North American Standards

Returnable Manually Handled Containers

Outside Dimensions		Pallet Size		Containers per Layer
IN (L x W x H)	MM (L x W x H)	IN	MM	
12 x 7 x 5	305 x 178 x 127	48 x 45	1219 x 1143	24
12 x 15 x 7	305 x 381 x 178	48 x 45	1219 x 1143	12
24 x 15 x 7	610 x 381 x 178	48 x 45	1219 x 1143	6
24 x 22 x 11	610 x 558 x 280	48 x 45	1219 x 1143	4
48 x 15 x 7	1219 x 381 x 178	48 x 45	1219 x 1143	3

Preferred Pallet Sizes	
IN	MM
48 x 45	1219 x 1143

Acceptable Pallet Sizes (Prior approval required)	
IN	MM
30 x 32	762 x 813

Returnable Bulk Containers	
IN (L x W x H)	MM (L x W x H)
32 x 30 x 25	813 x 762 x 635
32 x 30 x 34	813 x 762 x 864
48 x 45 x 25	1219 x 1143 x 635
48 x 45 x 34	1219 x 1143 x 864

Note: These are right-sized returnable containers and all dimensions are outside dimensions.

Attachment A3 – Standard Container Menu: Sea Container Standards

Manually Handled Containers

Corrugated Carton Code	Expendable Carton (L x W x H)		Pallet Size		Containers per Layer
	(MM)	(IN)	(MM)	(IN)	
	240 x 160 x 120	9.4 x 6.3 x 4.7	1140 x 980	45.0 x 38.6	28
	280 x 240 x 120	11 x 9.4 x 4.7	1140 x 980	45.0 x 38.6	16
1215-07	399 x 272 x 185	15.7 x 10.7 x 7.3	1220 x 1140	48.0 x 45.0	12
1215-09	399 x 272 x 236	15.7 x 10.7 x 9.3	1220 x 1140	48.0 x 45.0	12
2415-07	599 x 363 x 185	23.6 x 14.3 x 7.3	1220 x 1140	48.0 x 45.0	6
2422-11	599 x 544 x 264	23.6 x 21.4 x 10.4	1220 x 1140	48.0 x 45.0	4
4815-07	1196 x 363 x 185	47.1 x 14.3 x 7.3	1220 x 1140	48.0 x 45.0	3

Bulk Containers (L x W x H) Designed for 40 ft. HQ Sea container	
MM	IN
1140 x 760 x 635	45.0 x 30.0 x 25.0
1194 x 1140 x 838	47.0 x 45.0 x 33.0
1321 x 1140 x 838	52.0 x 45.0 x 33.0

Preferred Pallet Sizes	
MM	IN
1220 x 1140	48.0 x 45.0
1140 x 980	45.0 x 38.6

Bulk Containers (L x W x H) Designed for 40 ft. Standard Sea container	
MM	IN
925 x 760 x 560	36.5 x 30.0 x 22.0
1194 x 1140 x 560	47.0 x 45.0 x 22.0
1194 x 1140 x 1118	47.0 x 45.0 x 44.0

This listing provides summary right-sized standards for expendable containers. Dimensions shown are outside dimensions.
For further detail, contact the receiving Magna plant!

Attachment A4 – Standard Container Menu: European Standards

Manually Handled Containers

Expendable Carton (L x W x H)		Returnable Container (L x W x H)		Pallet Size	Containers per Layer
MM	IN	MM	IN	MM	
200 x 150 x 140	7.9 x 5.9 x 5.5			600 x 800	16
300 x 200 x 140	11.8 x 7.9 x 5.5	300 x 200 x 147	11.8 x 7.9 x 5.8	1200 x 800	16
400 x 300 x 140	15.7 x 11.8 x 5.5	400 x 300 x 147	15.7 x 11.8 x 5.8	1200 x 800	8
400 x 300 x 210	15.7 x 11.8 x 8.3	400 x 300 x 213	15.7 x 11.8 x 8.4	1200 x 800	8
400 x 300 x 280	15.7 x 11.8 x 11	400 x 300 x 280	15.7 x 11.8 x 11	1200 x 800	8
600 x 400 x 140	23.6 x 15.7 x 5.5	600 x 400 x 147	23.6 x 15.7 x 5.8	1200 x 800	4
600 x 400 x 210	23.6 x 15.7 x 8.3	600 x 400 x 213	23.6 x 15.7 x 8.4	1200 x 800	4
600 x 400 x 280	23.6 x 15.7 x 11	600 x 400 x 280	23.6 x 15.7 x 11	1200 x 800	4

Preferred Pallet Sizes	
MM	IN
1200 x 800	47.2 x 31.5
1200 x 1000	47.2 x 39.4

Acceptable Pallet Sizes (Prior approval required)	
MM	IN
600 x 800	23.6 x 31.5

Expendable Bulk Containers (L x W x H)	
MM	IN
800 x 600 x 730	31.5 x 23.6 x 28.7
1200 x 800 x 730	47.2 x 31.5 x 28.7
1200 x 800 x 970	47.2 x 31.5 x 38.2
1200 x 1000 x 970	47.2 x 39.4 x 38.2

Returnable Bulk Containers (L x W x H)	
MM	IN
800 x 600 x 835	31.5 x 23.6 x 32.9
1200 x 800 x 750	47.2 x 31.5 x 29.5
1200 x 800 x 990	47.2 x 31.5 x 39.0
1200 x 1000 x 990	47.2 x 39.4 x 39.0

This listing provides summary right-sized standards for returnable and expendable containers. Dimensions shown are outside dimensions. **For further detail, contact the receiving Magna plant!**

Attachment A5 – Standard Container Menu: Asia Standards

Manually Handled Containers

Expendable Carton (L x W x H)		Returnable Container (L x W x H)		Pallet Size	Containers per Layer
MM	IN	MM	IN	MM	
200 x 165 x 125	7.9 x 6.5 x 4.9			600 x 500	9
300 x 200 x 125	11.8 x 7.9 x 4.9	300 x 200 x 120	11.8 x 7.9 x 4.7	1200 x 1000	20
400 x 300 x 125	15.7 x 11.8 x 4.9	400 x 300 x 120	15.7 x 11.8 x 4.7	1200 x 1000	10
400 x 300 x 250	15.7 x 11.8 x 9.8	400 x 300 x 230	15.7 x 11.8 x 9	1200 x 1000	10
600 x 400 x 125	23.6 x 15.7 x 4.9	600 x 400 x 120	23.6 x 15.7 x 4.7	1200 x 1000	5
600 x 400 x 250	23.6 x 15.7 x 9.8	600 x 400 x 230	23.6 x 15.7 x 9	1200 x 1000	5

Preferred Pallet Sizes	
MM	IN
1200 x 800	47.2 x 31.5
1200 x 1000	47.2 x 39.4

Acceptable Pallet Sizes (Prior approval required)	
MM	IN
600 x 500	23.6 x 19.7
1100 x 1100	43.3 x 43.3

Expendable Bulk Containers (L x W x H)	
MM	IN
1000 x 800 x 750	39.4 x 31.5 x 29.5
1200 x 800 x 750	47.2 x 31.5 x 29.5
1200 x 1000 x 750	47.2 x 39.4 x 29.5

Returnable Bulk Containers (L x W x H)	
MM	IN
1000 x 750 x 750	39.4 x 29.5 x 29.5
1200 x 750 x 750	47.2 x 29.5 x 29.5
1200 x 1000 x 750	47.2 x 39.4 x 29.5
1600 x 750 x 750	63.0 x 29.5 x 29.5

This listing provides summary right-sized standards for returnable and expendable containers.
Dimensions shown are outside dimensions.
For further detail, contact the receiving Magna plant!

12. GLOSSARY OF TERMS

Box (Carton) - A rigid container having closed faces and completely enclosing its contents.

Box Maker - Corrugated or solid fibre box manufacturing establishment which has equipment to score, slot, print and join corrugated or solid fibre sheets into boxes, which equipment is regularly utilized in the production of fibre boxes in commercial quantities.

Brick Stacking - Act of alternating the stacking of containers on pallets, length by width and width by length.

Bursting Strength - The strength of material expressed in pounds per square inch.

Closure - The method used to seal a container once the parts have been packaged within it.

Deck - The horizontal load-carrying or load-bearing surface of a pallet.

Deck board - The surface element used in the construction of a pallet deck.

Distribution Environment – The entire material flow process from supplier through user.

Dunnage - Devices or materials used to hold, secure, or protect goods during shipment.

Expendable – A pack that makes only one trip.

Edge Crush Test (ECT) – Corrugated board test to determine the force that will crush a standard size of board standing on an edge. ECT indicated the probable compression strength of the container made from the board.

Footprint - The outermost dimensions (length and width) of a pallet, container or container system.

Four-way Pallet - A pallet constructed to allow insertion and withdrawal of handling equipment from all sides of the pallet.

Height -The overall dimension of the container in the vertical direction.

Half Slotted Container - Same as Regular Slotted Container without one set of flaps (a box which requires a separate lid).

Joint - That part of the box where the ends of the scored and slotted blank are jointed together by taping, stitching, or gluing. When accomplished in the box manufacturer's plant, it is known as a manufacturer's joint; when effected at the time the box flaps are sealed in a box user's plant (usually on automatic equipment), it is called a user's joint.

Mixed Load – more than one part number shipped on/or in a single secondary container.

Overhang - That portion of the unit load that exceeds the width or length dimension of a pallet.

Pack Validation –The process used to test the basic functions of containment and protection.

Pad - A corrugated or solid fibreboard sheet or other authorized material used for extra protection or for separating tiers or layers of articles when packed for shipment.

Pallet - A horizontal platform device used as a base for assembling, storing, handling, and transporting materials and products in a unit load.

Performance - Perform in various ways for enabling packing, handling, storage, transportation, unpacking, disposal, etc.

Placard – An easy release label or card holder area affixed to a container for the purpose of placing a label or kanban card.

PPAP - Production Part Approval Process.

PPL – Plant Packaging Leader

PPM – Plant Purchasing Manager

Primary Container - The shippable container closest to the parts.

Protection – To protect the product from various hazards encountered in the distribution environment.

Returnable – A pack that makes multiple trips.

Rightsizing - Containerization that optimizes the entire material flow process from supplier to user.

Regular Slotted Container - Corrugated box where all flaps have the same length, and the two outer flaps (normally the lengthwise flaps) are one-half the container's width, so that they meet at the center of the box when folded.

Score - Impression or crease in corrugated or solid fibreboard to locate and facilitate folding. (See also Slit-Score).

Secondary Container - Larger container on which multiple primary containers are shipped.

Secondary Container Length – Length of the secondary container. For wood pallets, it is the dimension of the stringers or stringer boards.

Secondary Container Width – Width of the secondary container. For wood pallets, it is the dimension of the top deck boards of a pallet.

Standard Pack - The Primary Container.

Standard Pack Quantity - Number of pieces in a shippable primary container.

Stitching or Stapling - Application of metal fasteners to form the joint of fibre boxes or to close boxes. Stitches are machine-formed using wire drawn from a spool. Staples are performed.

Stringer - A continuous longitudinal board member of a pallet that supports the horizontal load-carrying or load-bearing surface.

Tape - A strip of plastic or paper, sometimes having a filler or reinforcement, coated on one side with an adhesive. It is used to form the joint on a fibre box or to close or reinforce such a box. Closure and reinforcement can also be affected with pressure-sensitive tape.

Top Deck - Load-carrying surface.

Unit Load Height – The overall height of the primary containers when stacked on the secondary container, measured from the bottom of the secondary container to the top of the highest primary container. For bulk containers, it is the height of the secondary container.

Weight Trigger – The weight under which the loaded container poses a low risk of injury thus no further analysis is needed. If the container exceeds its weight trigger, further analysis is required.

For additional assistance, questions concerning these guidelines or packaging and dunnage design issues; please contact your plant PPL and/or:

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