Name	GLOBAL PACKAGING STD-PRODUCTION PARTS	**ESW Number**
Identifier	PLANT MANUFACTURING SPECIFICATION (ITEM)	FGD-PKG-19041

Abstract

This standard establishes requirements for packaging of production parts shipped from supplier locations to Atmus manufacturing sites globally.

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1. Scope

The standard provides requirements for all production and pre-production parts and materials supplied to Atmus sites worldwide, including all intercompany sales.

Specific procedures and/or requirements may exist in each plant and may not be included within this document so it is critical that suppliers work to understand any specific Atmus receiving site requirements. (See the Site-Specific Packaging Requirements in the Atmus Supplier Portal for more information). Suppliers shall prepare a Packaging Data Sheet (PDS) and submit their packaging proposal to each of the specific.

2. Applicable Documents

Applicable documents listed below may be obtained from the respective organizations listed.

a. AIAG B3, Shipping/Parts Identification Label Application Standard
b. ASTM D4169, Standard Practice for Performance Testing of Shipping Containers and Systems
c. ASTM D7611, Standard Practice for Coding Plastic Manufactured Articles for Resin Identification
d. ISO 6780, Flat Pallets for Intercontinental Materials Handling -- Principal Dimensions and Tolerances
e. ISO 8611-1, Pallets for Materials Handling -- Flat Pallets -- Part 1: Test Methods
f. ISO 8611-2, Pallets for Materials Handling -- Flat Pallets -- Part 2: Performance Requirements and Selection of Tests
g. ISO 8611-3, Pallets for Materials Handling -- Flat Pallets -- Part 3: Maximum Working Loads
h. ISPM 15, Regulation of Wood Packaging Material in International Trade
i. National Wooden Pallet and Container Association (NWPCA): Uniform Standard for Wood and Pallets

3. Definitions

Terms used in this standard are listed in Section 7.4 Label Specific Glossary of Terms and Appendix A: Packaging Glossary of Terms.

4. Introduction and General Information

4.1. Introduction

The Atmus Global Packaging Standard-Production Parts, hereinafter "the Standard" has been created with the goal to standardize packaging, reduce waste, and improve quality and packaging sustainability while providing parts at the lowest total cost. Packaging is a key element in the supply chain which can impact safety, environment, quality, line-side delivery, order quantities, inventory levels, freight utilization and customer satisfaction.

Packaging designs shall focus on environmental impact and safety including consideration to ergonomics and unit load stability in transit through point of use. Specific guidance on acceptable materials and methods is outlined throughout the Standard.

In this document the word "should" indicates a Atmus recommendation, the word "shall" indicates a Atmus requirement and the word "must" indicates a requirement by law or statute. It is the intent of Atmus that all suppliers shall comply with the requirements in this document. The chapters within this document will provide suppliers with the necessary information to meet Atmus' expectations for component part delivery.

4.2. Purpose

This document specifies packaging practices and standards for all suppliers of component parts to any and all Atmus manufacturing facilities. For Suppliers of parts to any and all Atmus Parts Distribution Centers reference the Global Packaging Standard-New & ReCon Parts. These Standards are the foundation for Suppliers to develop their part specific packaging specifications and ensure that all incoming component(s) are adequately protected at the lowest total cost with due consideration of sustainability and the entire supply chain flow. Supplier packaging shall preserve part quality through the entire distribution chain up to and including the point of use regardless of the freight terms or mode of transport.

4.3. Supplier Compliance

It is the position of Atmus Filtration that the supplier (or distributor) is responsible for the selection of the packaging materials, the packaging design and the packaging execution and its performance; the materials, design, and execution of the packaging shall be guided by the Atmus Standard.

It is the responsibility of the supplier to execute the protective measures required to facilitate the safe and defect-free delivery of the supplied parts to the site of use. In as such, it is the responsibility of the supplier to know the location of the use site, and the challenges that may be encountered during shipping including all shipping processes and modes, conditions (including but not limited to handling, temperature, humidity, distance to location, potential adverse road conditions, atmospheric anomalies (i.e. Container Rain), storage conditions, etc.), and/or contracted freight arrangements

4.3.1 Supplier Compliance (Continued)

It is also the responsibility of the supplier to prepare and submit a detailed Packaging Data Sheet (PDS) and have it reviewed. Simply submitting a PDS does not qualify as an approval of the packaging materials, design, or execution. Failure to comply with the requirements set forth in this document could result in Material Non-Conformance Reports and/or Supplier Corrective Action Reports. These actions may result in fees, quality actions or loss of business as specified in other sections further described in this document and/or in the supply agreement.

PDS Approval indicates acceptance of the supplier's proposal; however, does not relieve the supplier of responsibility for packaging performance to the point of use.

If a supplier does not have a PDS on file, failures in the package performance, selected by the supplier, may also result in an MNC or SCAR. In such case, all associated costs and Quality PPM will also be assessed against the supplier.

The PDS is to be submitted to the e-mail address noted in the Supplier Portal with a copy sent to the Atmus Sourcing Manager responsible for the part (both steps are mandatory).

Atmus will randomly inspect incoming packaging to determine compliance per the

Standard. Where additional regulatory or other packaging requirements exist, or are not covered in this Standard, the supplier is responsible to obtain and assure compliance.

In the event of noncompliance to the specifications within this document, Atmus reserves the right to:

4.3.1 Issue a Material Non-Conformance (MNC) to document the non-conformance to notify the supplier of corrective action required.

4.3.2 Issue a Supplier Corrective Action Report (SCAR) to document and drive corrective action through a Supplier Quality Improvement Engineer (SQIE) led 7-Step process.

4.3.3 Reject and request a Return Material Authorization (RMA) to return any shipment(s) received that are improperly packaged and/or identified at the supplier's expense.

4.3.4 Charge the supplier for any cost due to non-compliance to the Standard. (e.g. may include the cost of material and/or labor for any repackaging, sorting, rework or replacement of damaged parts, etc.).

4.3.5 Consider removing the supplier as a supplier.

4.4. Key Contacts

Beyond the global requirements provided for here-in, suppliers are required to understand and comply with Atmus receiving Site Specific Packaging Requirements and thus facilitate a prompt approval of their packaging proposal.

Questions specific to this Packaging Standard shall be submitted in writing to the Sourcing Manager.

In using or applying the Atmus Global Packaging Standard you may have recommendations or questions requiring clarification or change. See Section 4.5. Packaging Specification Approval Process on page 10.

In using or applying the Atmus Global Packaging Standard you may have recommendations or questions requiring clarification or change.

Recommendations or questions are to be submitted to the Sourcing Manager using the Stakeholder Input Form as follows:

a. Stakeholder queries Sourcing Manager
b. Sourcing Manager provides Stakeholder Input Form to Stakeholder
c. Stakeholder returns completed Form to Sourcing Manager
d. Sourcing Manager vets Stakeholder input
e. Sourcing Manager forwards completed form to GPC Packaging

Leader The supplier is responsible to monitor the Standard and

Standard Revision History.

4.5. Packaging Specification Approval Process

Internal and external Suppliers shall follow the process below in order to assure that their packaging meets the Standard and the site-specific packaging requirements.

Expendable packaging price per unit shall be defined as a separate line item in all piece part price quotations to Atmus Purchasing and in the Packaging Data Sheet (PDS) referenced in Appendix C: Packaging Data Sheet (PDS) on page 63.

4.5.1 Plant Packaging Representatives are responsible for establishing their specific receiving site packaging parameters for the Supplier. For example:

a. Footprint restrictions
b. Weight & Height limitations
c. Quantity per container limits
d. Special Quality requirements
e. Line side presentation orientation requirements
f. Material type restrictions

4.5.2 Suppliers shall contact the Packaging Representative from each specific Atmus receiving site to inquire about specific site-related packaging parameters. A limited number of Atmus receiving sites have identified and documented their site-specific packaging requirements that shall be included in Supplier's packaging proposal(s). Suppliers may find the Atmus Site Specific Packaging Requirements document published in the Atmus Supplier Portal. For any questions regarding site-specific requirements, please contact the site Packaging Representative.

4.5.3 Supplier shall develop their packaging proposal based on the Standard and the Atmus receiving site specific requirements. It is the responsibility of the supplier to assure all data is complete and correct. Material Non-Conformance (MNC) or Supplier Corrective Action Reports (SCAR) for the parts supplied.

4.5.4 Where a part is used in both production and aftermarket/service applications the PDS approval process is required for all Atmus manufacturing sites and Product Distribution Centers (PDC's).

4.5.5 Each receiving site shall review the Suppliers proposed packaging from the Packaging Data Sheets and route internally for approval.

4.5.6 All individual part packaging specifications and related costs shall be defined prior to shipment of parts to an Atmus receiving site. No changes shall be made except those authorized by the Atmus receiving site Packaging Representative.

5. Packaging Requirements

Supplier is responsible for packaging quality to assure proper component protection while in shipment from point of origin through point of use with consideration of all carrier modes used to transport freight.

5.1. Part Protection

Parts and materials shall be packaged with the following considerations:

5.1.1. Plan the packaging such that parts may be removed without unnecessary handling.

5.1.2. Nested parts may be sequentially packed but shall be easily removed from the packaging.

5.1.3. Plan the packaging such that a safe and stable unit load is maintained in the "as packed" condition when the closure is removed.

5.1.4. Protect open holes of functional parts which may be adversely affected by contaminants.

5.1.5. When plugs and caps are used they shall be easy to remove, but shall remain intact during transportation and handling.

5.1.6. Protect functional and pre-calibrated parts to the extent necessary to insure print specification compliance.

5.1.7. Protect special surfaces such as:

a. Machined Surfaces
b. Finish painted or to be painted
c. Finish plated or to be plated

5.2. Failsafing

Packaging may be designed to failsafe our manufacturing processes and/or to facilitate assembly through the incorporation of a mistake-proofing function to the packaging and/or through part presentation.

Examples:

a. Matched parts packaged as sets with a clear association of mating parts.
b. Scanning of the bar code parts identification labels can failsafe part introduction to the manufacturing process.
c. Where possible match packaging counts to assembly unit requirements.

5.3. Part Cleanliness

Supplier packaging and preservation methods shall protect for print specified part cleanliness requirements. Parts that are not clean due to packaging debris will be considered out of specification and may be subject to MNC or SCAR through the Part Quality System. The defect is considered a part specific defect even though the corrective action may require the Packaging Departments to lead the improvement. An example of this could be a part that has corrugated fiber or plastic shavings from dividers that have contaminated the part.

5.4. Preservation and Shelf Life

The requirements below are general and may be supplemented by order of the Atmus Supplier Quality Improvement Engineer as required for specific parts.

Preservation is the action required to prevent corrosion or deterioration and is normally independent of the packaging.

Preservation shall be sufficient to protect the product from any corrosion or deterioration for a period of 6 months for production parts and 18-months for aftermarket / Service parts, under normal warehouse storage and transportation conditions. The 6 or 18 month period begins when Atmus assumes title to the goods.

It is Atmus preference for the corrosion prevention material used to provide a dry-to-

touch component whenever possible.

The Supplier shall, upon request, provide a copy of a Safety Data Sheet (SDS) for preservatives used.

5.5. Sustainability and Environmental Impact

The supplier is responsible to comply with Atmus sustainability initiatives to continually reduce our waste and disposal cost, and to increase our recycling efforts.

5.5.1 Packaging shall be created with consideration of all governmental regulations and environmental impact from packaging material selection through the end-of-life cycle.

5.5.1.1 Acceptable packaging materials include, but are not limited to:

a. Clean corrugated/fiberboard
b. Coated (non-wax) and fully recyclable fiberboard
c. Molded pulp
d. Clean Kraft Paper
e. Paper (VCI treated acceptable)
f. Polyethylene materials (HDPE, LDPE, LLDPE) other than foams
g. Polyethylene Terephthalate (PET, PETE, PETG, RPET)
h. Polypropylene materials (PP)
i. Steel
j. Wooden pallets/boxes/crates:
   * shall comply with International Standards for Phytosanitary Measures (ISPM-15).
   * Manufactured wood packaging materials shall comply with Atmus exposure limits of 0.016 ppm [0.02 mg/m^3 of formaldehyde per cubic meter of air (mg/m^3)] as an 8 hourtotal weighted average and 0.1 ppm (0.15 mg/m^3) as a ceiling concentration determined in any 15 minute sampling.

5.5.1.1. Biodegradable and commercially compostable materials are preferred whenever possible.

5.5.1.2. In-process (pre-consumer) recycled materials and post-consumer recycled materials (PCR) are preferred whenever possible.

5.5.1.3. Allowable packaging materials with Atmus receiving site approval at the part number level:

a. Single Use plastics (e.g. partitions, layer trays and pads)
b. Foams (Ethylene, Propylene, Styrene, Urethane, etc.)
c. Polyvinyl Chloride (PVC)

5.5.1.4. Prohibited packaging materials include:

a. Hazardous materials except those allowed and regulated by World Health Organization standards.
b. Soiled Corrugated (oil soaked).
c. Wax or poly-coated corrugated (these are non-recyclable).
d. Microfoam laminated corrugated.
e. Materials (solid wood) requiring ISPM 15 compliance treated with methyl bromide (MB) are strictly prohibited in all European Union and United Kingdom nations. All part packages consisting of solid wood packaging materials shall use other than MB treatments to comply with ISPM 15 for all Atmus directed shipments (including Joint Venture locations).

5.5.1.5. Where practicable, all polymer resin material shall have the recycling resin code visible and legible. Per ASTM D7611—Standard Practice for Coding Plastic Manufactured Articles for Resin Identification.

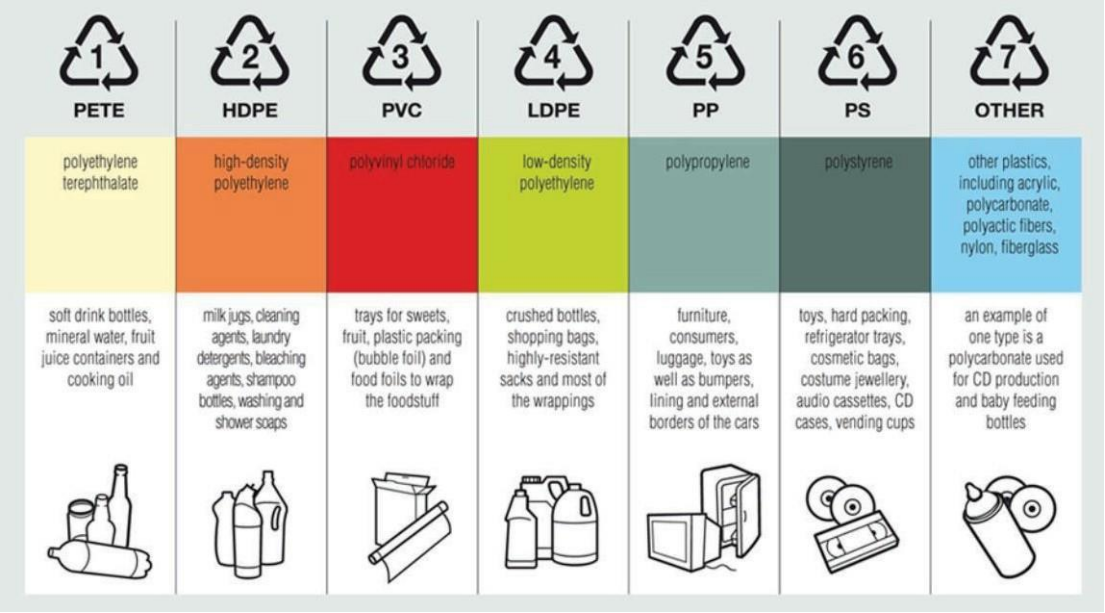


Figure 3: Recycling Resin Code per Sustainable Packaging Coalition

5.5.1.6. Design packaging to minimize the environmental impact by:

a. Reducing the amount of material needed for the packaging and avoiding the use of non- renewable resources.
b. Reusing the packaging material in a manner that is safe and cost-effective with special attention to transportation distances necessary to complete the cycle.
c. Maximizing the use of renewable or recycled packaging materials.

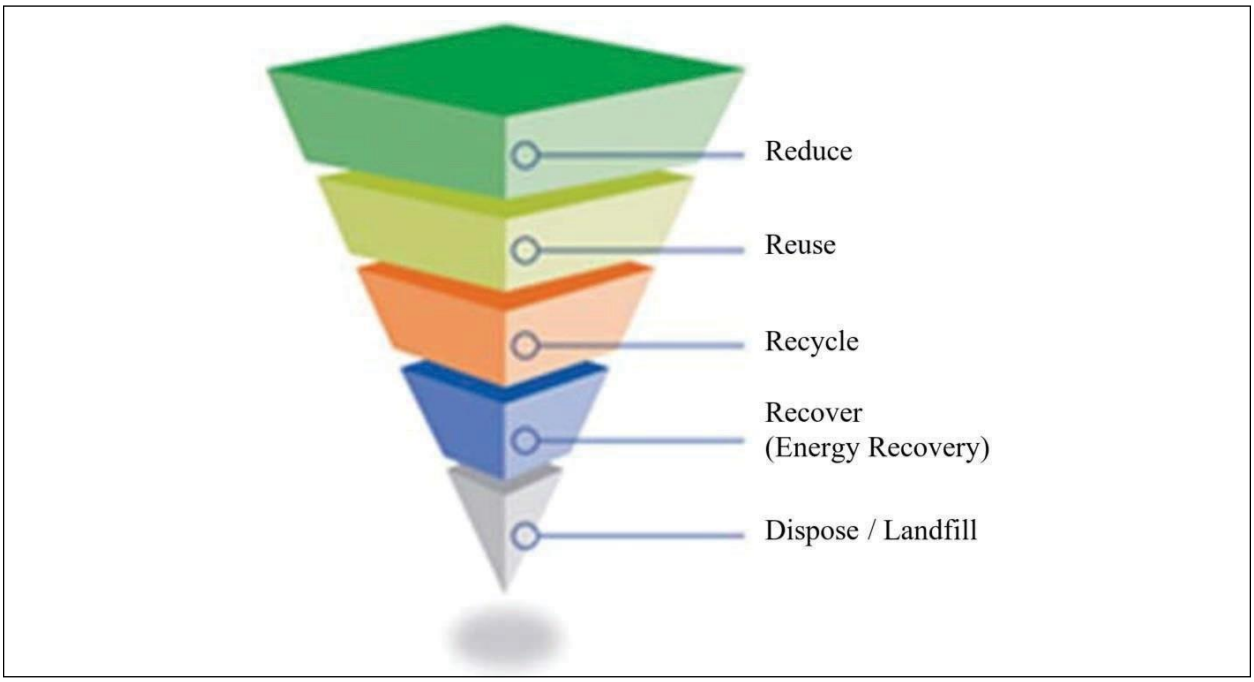


Figure 4: Environmental Impact

5.6. Lean Principles in Containerization

The following guidelines shall be used in establishing the right-sized container, type and part orientation.

a. Containerization and packaging methods shall optimize pack density with consideration for part quality, ergonomics and cost.
b. Part orientation for ergonomic presentation shall optimize the operators grasp, lift, manipulation and part transfer to the work.
c. Part orientation in the container shall utilize the relative location to the container label as a reference for consistent presentation at line-side.
d. Where dunnage is required, its orientation within the container shall be consistently applied such that the part-to-shipping label relationship is maintained.
e. Manually handled containers are the preferred method when an ergonomic advantage can be realized by a decreased reach or lift distance.
f. The Gross Weight Limit (GWL) for manually handled containers to any given Atmus facility shall not exceed 15 kg or 33 lbs.
g. Manually handled containers are indicated when the part dimensions, features, and weight will allow the container to safely house in an ergonomically favorable orientation a maximum gross weight of 15 kg, with a target quantity of one third (1/3) to one hours production.
h. Where site usage dictates, manually handled containers shall be sized such that the Standard Pack Quantity (SPQ) does not exceed one day's production – with the exception of high-density commodity items such as fasteners.

5.7. Packaging Materials

5.7.1. Packaging Design and Material Selection.

The supplier shall consider the following general practices in establishing packaging design and material selection.

5.7.1.1. The supplier shall utilize materials of sufficient strength and integrity to provide for the safe transport of quality parts to the point of use.

5.7.1.2. The supplier shall apply proper packaging principles in container and dunnage design with considerations for both static and dynamic conditions.

5.7.1.3. The supplier shall apply proper packaging principles in palletization and unit load securement.

a. Polyester strapping is preferred.
b. Metal strapping shall not be used without express written permission at the part number level from the Atmus Receiving Site Packaging Representative.

5.7.1.4. Containers are to be sized such that solid foundational support is derived from the pallet (no container/carton/part overhang allowed).

5.7.1.5. Use of corner posts and angle board are acceptable means of enhancing unit-load performance as required.

5.7.1.6. Consideration shall be given to environmental regulations where applicable.

5.7.2. Pallet Design and Construction

The design and construction of the pallet shall effectively allow for the acceptable delivery and storage of the product. It is the responsibility of the supplier to determine the quality and performance of the pallet and that it meets and/or exceeds the requirements, taking into consideration all expected dynamics encountered during the distribution and storage environment.

Recycled and/or refurbished pallets shall perform the same as new pallets.

It is recommended that pallet design and testing follow industry standards, including but not limited to:

a. ISO 6780: Flat pallets for intercontinental materials handling — Principal dimensions and tolerances
b. ISO 8611-1: Pallets for materials handling — Flat pallets — Part 1: Test methods
c. ISO 8611-2: Pallets for materials handling — Flat pallets — Part 2: Performance requirements and selection of tests
d. ISO 8611-3: Pallets for materials handling — Flat pallets — Part 3: Maximum working loads
e. National Wooden Pallet and Container Association (NWPCA): UNIFORM STANDARD FOR WOOD PALLETS

5.7.2.1. Pallet Design Requirements:

It is REQUIRED that all international shipments and any shipments to Atmus Aftermarket Parts Distribution Centers comply with ISPM 15 and the mark must be:

a. Legible
b. Durable and not transferable
c. Placed in a location that is visible when the wood packaging is in use, preferably on at least two opposite sides of the wood packaging unit

The mark must not be hand drawn. See Figure 7: ISPM-15 Certification Mark on page 23 for an example of the required marking(s).

a. Pallets 40-inch L x 40-inch W (1016 mm x 1016 mm) and larger shall have 4-way entry.
b. Open space between top deck boards shall not exceed 3 inches (76 mm).
c. Top and bottom edge deck boards shall be flush with stringer ends within normal tolerances.
d. Stringer pallets shall have a minimum lift access of 3.5 inches (89 mm). Notched stringers on 4-way entry pallets shall have an opening height of 2.5 inches (64 mm). Notched opening shall be 9 inches (229 mm) wide, with radial cut top corners and placed on 16 inch to 24 inch (406 mm to 610 mm) centers.
e. Block style pallets shall have a minimum lift access of 4-inches (100 mm).
f. Pallets shall have sufficient beam strength for use with warehouse storage racks.
g. All fastener heads shall be countersunk or flush and remain so for the entire use and storage of the product/package.

5.7.2.2. Acceptable Pallet Styles (See Figure 5: Acceptable Pallet Styles on page 22).

a. Block Style, with 9-Block Risers
b. 2-Way Entry, Flush Style Pallet
c. 4-Way Entry, Flush Style Pallet

d. Plastic pallets may also be acceptable. Contact the Sourcing Manager and Packaging Representative at the receiving site to confirm acceptance. The review shall consider the recycling capabilities at the site for such materials. Be prepared to share material of construction and weight information. Metal, wood, or other mixed plastic reinforcements within the pallet design is not acceptable. Pressed wood pallets with bottom deck boards that allow weight distribution when stacked on other unit loads.

5.7.2.3. Unacceptable Pallet Styles (See Figure 6: Examples of Unacceptable Pallet Styles on page 23).

a. Single Faced Stringer or Block (No bottom deck boards)
b. Single Winged Stringer
c. Double Winged Stringer
d. Plastic with reinforced structure considered one way without a return program implemented
e. Plastic where no recycling stream has been identified and/or implemented
f. Pressed wood/pulp with no bottom deck boards

Figure 5: Acceptable Pallet Styles

Figure 6: Examples of Unacceptable Pallet Styles

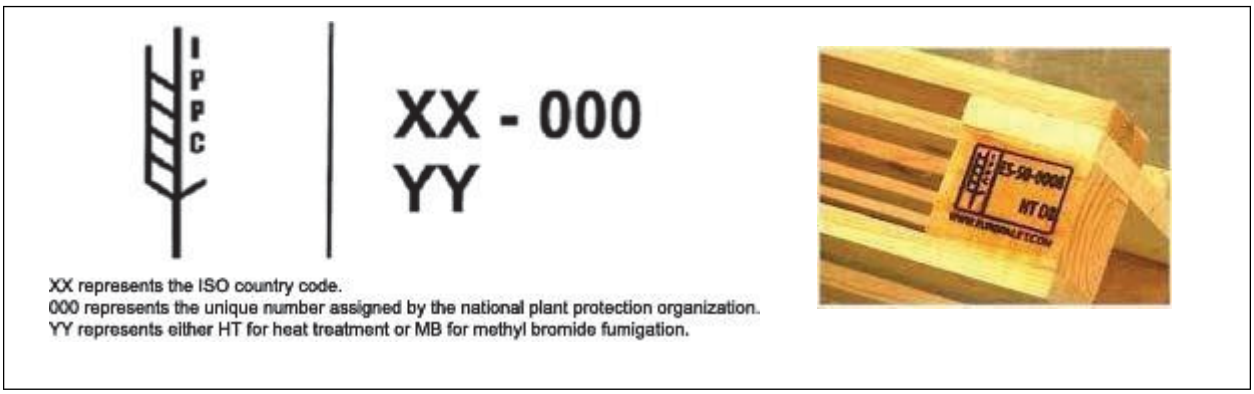


Figure 7: ISPM-15 Certification Mark

5.8. Package Closure

Container styles and methods of closure that require the use of knives or other tools are discouraged.

5.8.1. Acceptable methods of closure are:

a. Adhesives
b. Sealing Tape
c. Polyester or Nylon Strapping (Banding)

5.8.2. The following methods of closure are prohibited, without written approval from the receiving site:

a. Metal Stitches and Staples
b. Steel Strapping (Banding)

5.9. Modularity

The following general guidelines shall be used in establishing the unit load footprint/cube. Where deviations are justified, the Supplier shall provide supporting rationalization upon request.

a. The unit load should be modular to the mode of transport from the supplier location to point of use.
b. Where multiple modes of transport are utilized, the unit load modularity should be optimized to the mode of transport resulting in the lowest total logistics cost.
c. Where multiple modes of transport are utilized and total logistics cost does not favor one mode over another, the unit load shall utilize the standards applicable to the global region of the receiving customer facility.
d. Where manually handled containers are determined to be the appropriate packaging method, the containers shall be modular to the unit load.
e. The supplier shall define carton dimensions to be modular to Unit Load cube appropriate to the method of transport, See Figure 8: Modularity & Cube Utilization of Loads on page 25 for examples of carton modularity and cube utilization.
f. Should maximize the space on the pallet and in the truck and take into consideration order quantity requirements, load weight, and package cost.

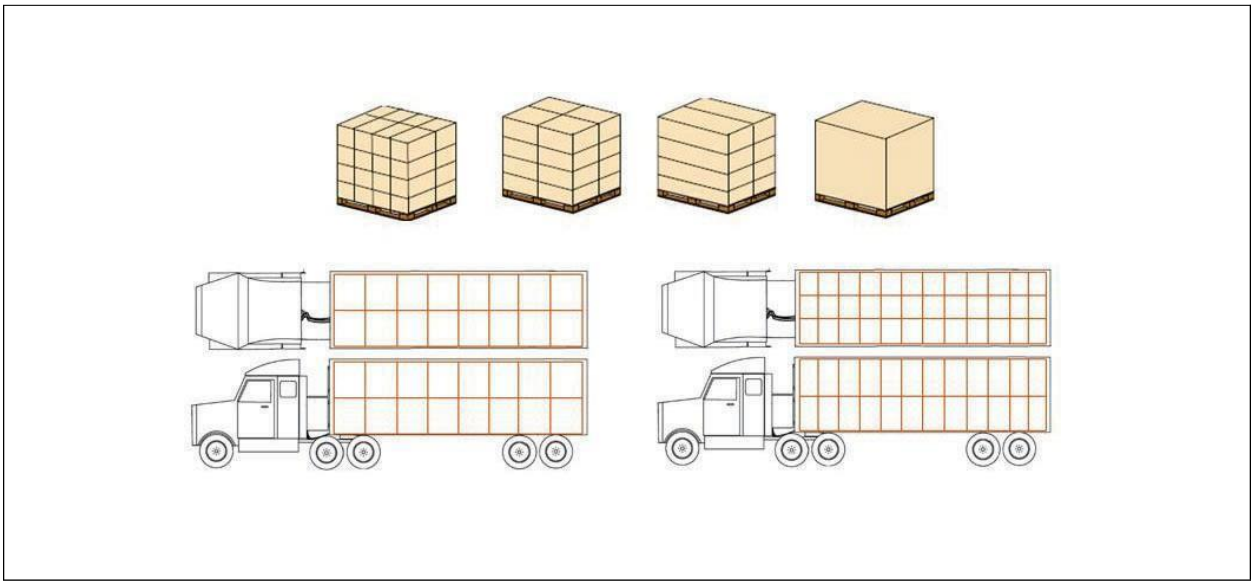


Figure 8: Modularity & Cube Utilization of Loads

5.10. Unit Load Stability and Stack-ability

5.10.1. Unit Load Integrity

The unit load shall be designed to maintain integrity during normal handling, transportation & storage.

a. The unit load shall safely stack up to 100" (2540 mm) in a dynamic environment (in transit) on a stable level plane of like freight (foot print & weight).
b. The unit load shall safely stack to the greater of three high or 10'6" (3200 mm), in a static environment (in warehouse). If stacking to this level is not recommended for any reason, the unit load shall be clearly marked with a label or other identifying feature. If the load is not stackable, written approval must be given by Atmus prior to acceptance.
c. To ensure maximum stacking strength, cartons unitized on a pallet shall be column stacked.
d. The maximum gross weight of loads shipped to Atmus locations shall not exceed 4,000 pounds per unit load unless authorized by the Atmus receiving site.
e. The unit load height to width ratio (h:w) shall not exceed 2:1 unless approved through the Atmus PDS approval process.

5.10.1. (Continued)

f. Unit loads shall be structured to maximize stability such that the center of gravity is located centrally to the container footprint and at the lowest elevation possible. If the part package is not capable of a balanced center of gravity, the center of gravity shall be clearly marked on the outside of the package to inform the logistics/warehouse personnel of the center of gravity location. This is a critical safety requirement and shall be noted on all sides of the load that could potentially be lifted by fork truck, crane, or other means.
g. Atmus shall make every effort to order in multiples of the SPQ as defined in the Supplier Agreement.
h. Atmus should make every effort to order in even layer quantities (even layer multiples of the SPQ).
i. Atmus should make every effort to order Standard Unit Load Quantities (SULQ) when schedules allow.

Note: Where Atmus is not compliant with these order quantity protocols (compromising value in the supply chain), it is incumbent on the supplier to formally communicate the concern and actively seek resolution.

j. Whenever possible, the unit load should contain parts of the same part number however, mixed loads are accepted as allowed by the Atmus Supply Chain Agreement specific to those parts and that Atmus receiving site.
k. When mixed loads are appropriate due to product mix and release quantity, the supplier shall apply proper packaging principles in palletization.
l. All unit loads shall be equalized to full layer orientation whenever possible. Stacking cartons in a pyramid configuration on a unit load is not permitted. Exceptions will require written deviation from the Atmus receiving site.

5.10.2. Special Purpose Export and Over-pack Guidelines

This section covers approved crating specifications to be used for international shipments where a robust export pack is required. These specifications are derived from research of various packaging styles, regionally available materials, manufacturing capabilities and transportation conditions.

Specifications are defined through the appendices listed below. These specifications are provided as recommendation to suppliers with limited Packaging Engineering resource to develop application specific containers suitable to protect their parts through the global distribution environment.

Note: Wood Crating, See Appendix B: Production Component Packaging Guideline - Solid Timber Closed Crating.

5.11. Extreme Distribution Conditions

Extreme distribution conditions require more robust packaging protection than standard domestic highway freight. Examples include Less-Than-Truck-Load (LTL) vs. Full-Truck-Load (FTL) highway freight, air freight, ocean freight, rail, and parcel package shipments.

a. Less-Than-Container-Load (LCL) vs. Full Container Load (FCL) ocean freight transport methods may require further refinements to packaging design.
b. Weather conditions and freight handling methods in different parts of the world require additional protection from the elements.
c. The supplier shall be responsible for adequately protecting the product and packaging from moisture through the inclusion of Volatile Corrosion Inhibitor (VCI), Desiccants, and an appropriate closure method.
d. Closure methods should include covering and/or sealing the unit load with a poly-bag or stretch wrap film. This is particularly critical when LCL transportation methods are used.

Deviating from the normal mode of transportation may require additional measures.

a. The Supplier should be required to “Over-pack” the unit load to assure a quality part to the point of use.
b. This requirement also applies to Atmus International Freight Forwarders.

5.12. Hazardous Material and Dangerous Goods Shipments

The supplier is responsible to understand and comply with the prevailing packaging and transportation regulations for the global regions through which their goods will ship.

5.13. Packaging Trial Shipments

Packaging trials may be required by the Atmus receiving site Packaging Representative to confirm the Supplier packaging proposal(s) as defined by the supplier PDS submission. The Supplier shall provide advance notice shipping/delivery coordination and follow-up. Trial shipment planning and coordination shall include the following:

Trial shipment identification labeling shall be on an approximately 8.5 in. x 11 in. (216 mm x 279 mm) plain white label as sample shown in Figure 9: Trial Shipment Identification Label on page 28.

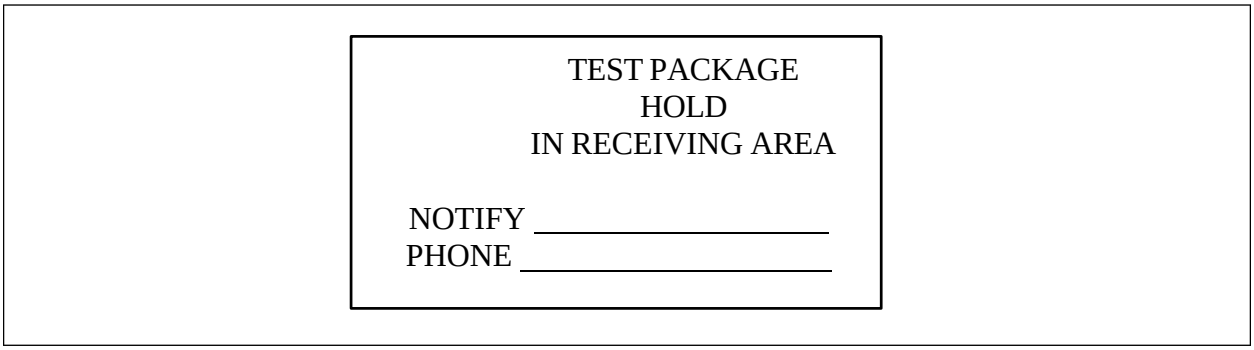


Figure 9: Trial Shipment Identification Label

Advanced notification to the Packaging Representative shall contain:

a. Photos of the packaging prior to shipment
b. Quantity shipped
c. PDS Form
d. Planned delivery date
e. Carrier
f. Bill of Lading and/or Tracking Number

5.14. Packaging Bill of Material and Process Documentation Requirements

The supplier shall establish and maintain a 'Packaging Process' document linking the Atmus part number to the required packaging components (Bill of Materials) and work instructions.

The Packaging Process document shall:

a. Use the Atmus part number as the primary reference.
b. Include the packaging part numbers, quantities, and descriptions of all packaging components required to assemble the unit load.
c. Include the packaging operation sequence considering part and dunnage orientation, and palletization layout.
d. Establish container orientation such that all possible container labels are visible around the perimeter of the unit load.

The Packaging Process and Work Instructions document shall be under document control and readily accessible to the Supplier packaging operator and Atmus upon request.

5.15. Packaging Plan

A graphic representation or 'Packaging Plan' is not a requirement but is a component of our vision for functional excellence in Supplier packaging. A functionally excellent 'Packaging Plan', in addition to the above requirements, would include the following in an exploded isometric format.

a. Part Description (Noun name)
b. Dunnage* (*if applicable) - with description notated
c. Part orientation - as packed including interface with dunnage* (*if applicable)
d. Part orientation - to the primary container label location
e. Primary container - with description & SPQ notated
f. Palletization layout of the unit load with label location indicated
g. Reference dimensions and weights of packaging components
h. Packaging Plan revision level / date of each document

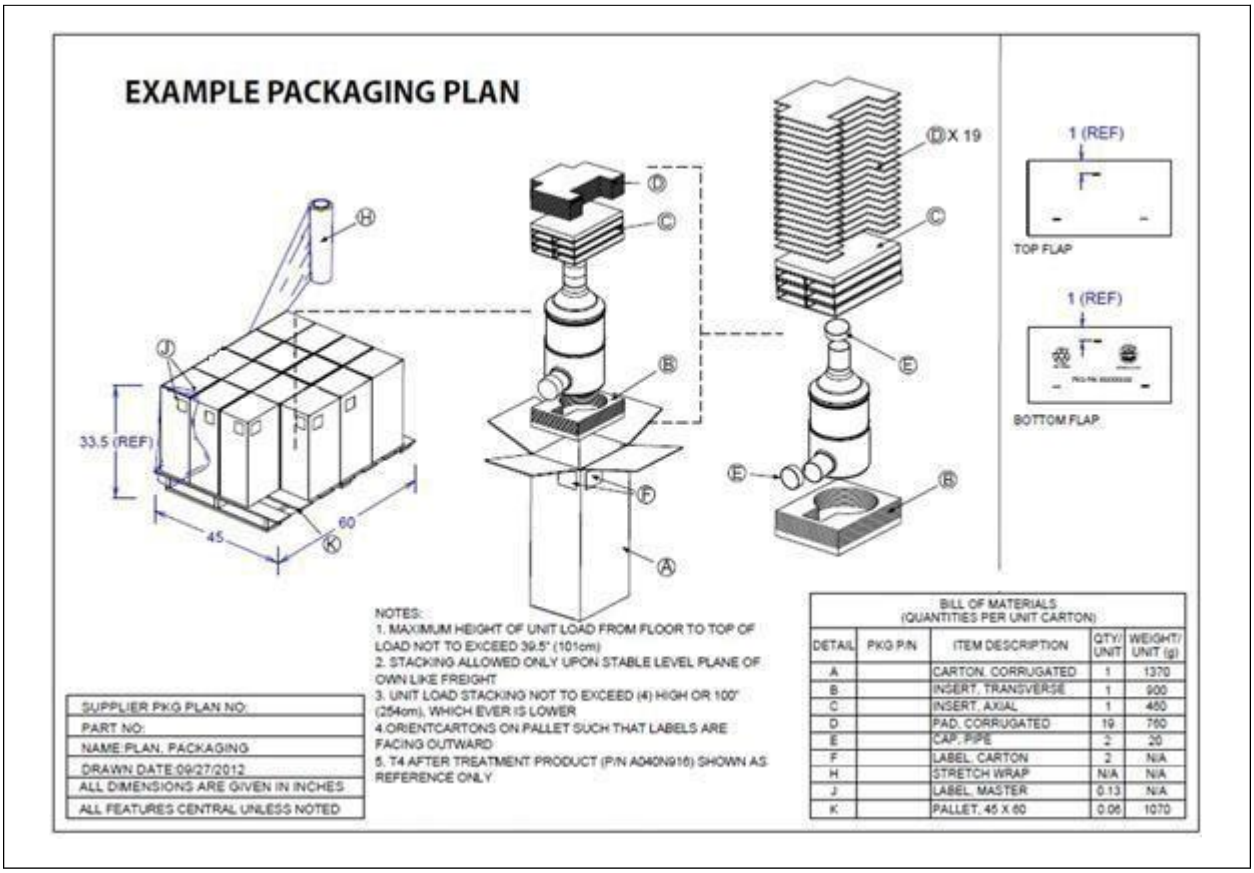


Figure 10: Example Packaging Plan

5.16. Packaging Test Standards

The supplier shall ensure part packaging performance complies with Atmus requirements. Atmus does not generally require Suppliers to perform laboratory validation testing of their packaging. Atmus recommends, and may require, especially in the instance of critical, high cost, sensitive or fragile parts, that testing be performed in a certified packaging test lab. The decision to perform validation testing, the selection of the appropriate test standard and assurance level is the responsibility of the Supplier. The packaging performance is the responsibility of the supplier regardless of the mode of transportation, with or without an approved PDS. This includes all packages that have been previously successfully shipped.

6. Dedicated Returnable Packaging

6.1. Introduction

Returnable Containers are used to maximize the economics of product flow between Supplier and Atmus manufacturing facilities. Further, these containers are utilized to reduce the collective use of expendable packaging and advance our achievement of shared environmental initiatives. Although the ambition, it is not the specific mandate of a returnable container program to completely eliminate the use of expendable material in conjunction with the use of the returnable containers. In some instances, expendable dunnage and/or strapping is necessary to effectively and economically deliver goods.

6.2. Returnable Packaging Policy

To ensure that product shipments are uninterrupted, the supplier shall always quote an expendable packaging solution that complies with the same containerization and configuration as the returnable packaging.

In NO Instance is the supplier to purchase returnable containers with the intent that they will be used to supply Atmus or with the belief that the supplier will be reimbursed for any such expenditure, without express written authorization from the responsible Atmus receiving site Packaging Representative and the responsible Atmus Sourcing Manager.

The responsible Atmus receiving site Packaging Representative will be the only acceptable source to approve and validate all returnable packaging proposals based on total cost of ownership. Unless provided by our Suppliers, the returnable containers are assets owned by Atmus and are accounted for as such.

6.3. Returnable Packaging Justification

Justification of returnable packaging is a function of multiple cost variables including but not limited to expendable packaging cost, logistics and investment. Returnable containers are deemed a viable alternative to expendable packaging only after a thorough costing, Return on Investment (ROI) and an environmental impact analysis is performed.

Note: Atmus Suppliers shall actively participate in the provision of data required to perform the justification analysis.

6.4. Returnable Packaging Funding and Ownership

6.4.1. Ownership

a. The Atmus preferred method is for the Atmus receiving site to own/lease the returnable packaging.
b. Supplier- owned returnable packaging may be an acceptable alternative but shall be negotiated and agreed upon by the Atmus receiving site.

6.4.2. Funding/Purchasing

The method of returnable packaging investment is determined by the Atmus receiving site and is typically supported by a reduction in Supplier's component piece price.

6.5. Atmus Responsibility

6.5.1. Atmus will determine the viability of the returnable packaging program and responsible party to provide the container fleet.

6.5.1.1. The supplier shall not assume that returnable "container" implies returnable dunnage. In certain circumstances returnable containers may be provided with the assumption that the supplier will provide expendable dunnage.

6.5.1.2. For Atmus owned returnable packaging, the Atmus Packaging Engineer will lead container/dunnage development and validation.

6.5.1.3. For Supplier owned returnable packaging, the Supplier will lead container/dunnage development and validation.

6.5.1.4. Returnable containers shall be outfitted with label placards, holders or clips as appropriate for the container size and type.

6.5.1.5. A Container Logistics Plan shall provide definition of the following as agreed upon by the Supplier and the Atmus receiving entity.

a. Dunnage Return Configuration or Methodology.
b. Utilization of Collapsibility Features and Return Configuration.
c. Container Cleaning and Maintenance Frequency/Plan.
d. Storage/reapplication container disposition plan at end-of-program.

6.5.2. Logistics Cost

All inbound and return logistics costs are the responsibility of the Atmus receiving site unless specifically stated in the Supply Chain Agreement between Atmus and the Supplier. The known exception to this policy is in the event of an expedited freight situation where Supplier is at fault. In this case, the Supplier will be responsible.

6.5.3. Returnable Container Maintenance

For Atmus owned returnable containers, the Atmus receiving site or 3PL provider is responsible for the performance of regular maintenance and cleaning of the containers unless other provisions are established in the Supplier/Atmus returnable packaging contract.

6.6. Supplier Responsibilities

Maintenance, cleaning, replacement, and purchase of additional containers due to demand are the responsibility of the owner of the returnable packaging. Atmus Suppliers are required to actively participate in the fleet management of returnable containers.

6.6.1. General Requirements

Suppliers are responsible for the following general requirements while the containers are within their control and/or possession:

a. Shall utilize containers only for shipment of the Atmus part and site for which they are intended.
b. Protect against theft and misuse by ensuring that returnable containers are handled properly and are always secure.
c. Provide a clean, dry and organized space for container storage that will not expose containers to the environment and with ready access and visibility to facilitate physical inventory upon request.

6.6.1. (Continued)

d. Ensure that returnable containers are not used for long-term, work-in-process (WIP), or any form of use that extends the days of use of the container beyond the agreed upon allowable possession time or 'float' days.
e. Suppliers shall have a backup expendable package solution and meet the same parameters as the returnable package (footprint, quantity).
f. Suppliers shall have an approved PDS for both the returnable and back-up expendable packaging.
g. Where the need for backup expendable packaging is directly attributable to Supplier not adhering to the agreed upon float days, the Supplier will bear the cost for the expendable packaging material purchase and any additional fees associated with the timely delivery of parts to the Atmus site.
h. Provide 6 months advance notification to Atmus receiving site(s) of changes in volume or logistics that will impact the agreed upon float days and/or fleet size requirements.
i. Shall not modify the containers in any way.
j. Shall apply shipping labels to containers in the designated locations using the methods (placard, holder or clip) provided.
k. Shall apply no other labels, marks or deface the containers in any way.
l. When requested by Atmus, suppliers are required to track containers at the receiving and shipping transaction level.
m. When requested by Atmus, Supplier are required to perform an inventory reconciliation of assigned containers at the frequency agreed upon with the Atmus receiving site or the 3PL provider.
n. Will incur charges for container loss deemed to be the result of poor practices or neglect by the Supplier.
o. The Supplier may be required to store containers during periods of reduced demand and at end-of-program pending the reapplication/disposition plan, for the period agreed upon by the Supplier and the Atmus receiving site.

6.6.2. Returnable Container Maintenance and Cleaning

For Atmus owned returnable containers, the Atmus receiving site or 3PL provider is responsible for the performance of regular maintenance and cleaning of the containers unless other provisions are established in the Supplier/Atmus contract.

6.6.2. Returnable Container Maintenance and Cleaning

(Continued) Suppliers are required to:

a. Isolate any damaged or suspect containers.
b. Identify all damaged or suspect containers utilizing Supplier's own non-conforming material tags.
c. Include specific detailed information as to the defect type and location on the container.
d. Return damaged or suspect containers immediately to the Atmus receiving site or 3PL provider.

Suppliers may be charged with the cost of maintenance when it is conclusive that the damage or defect was caused by the negligent actions of the Supplier and/or its representatives.

Suppliers shall confirm all returned containers have all expired Shipping/Parts Identification Labels removed, are free of debris, and in safe usable condition.

For Supplier owned returnable containers, the Supplier is responsible for the performance of regular maintenance and cleaning of the containers unless other provisions are established in the Supplier/Atmus contract.

7. Bar Code Shipping/Parts Label Specifications

7.1. Purpose

To standardize the requirements for packaged material identification from point of origin to point of use.

7.2. Scope

These requirements pertain to all production parts and/or materials, including samples shipping to all Atmus global manufacturing facilities.

7.3. Introduction

The preferred Atmus labeling format is ODETTE. The Odette format was originally used primarily in Europe but has since been adopted by many global automotive suppliers. Another acceptable label is the AIAG Shipping/Parts Identification Label Standard. The Atmus Legacy Label Format is based on the AIAG B-3 format (See Figure 15: Legacy Atmus Label with Gross Wt. and Country of Origin on page 41 below), and several sites have adopted later versions. Refer to Site Specific Packaging Requirements for further details and submit a package label example on the Packaging Data Sheet (PDS) for approval.

These labels are designed to improve supplier and customer productivity and controls of suppliers and customers by allowing effective and efficient capture of data for production counts, warehouse input/output, cycle counting, shipper generation, forwarding, freight transfer control, receiving and other inventory controls. Every effort should be made by the supplier to provide barcoded labels that meet these specifications.

Failure to use the labeling formats presented in this document may result in the issuance of an MNC or SCAR, resulting in administrative fees, additional fees (determined by the Atmus Quality Group) and PPM scores against the suppliers quality rating.

7.4. Label Specific Glossary of Terms

a. Item- A single part of material purchased, manufactured, and/or distributed.
b. Standard Quantity Pack- A pack which always contains a standard quantity of like items.
c. Non-Standard Quantity Pack- A pack which contains variable quantities of like items.
d. Common Item Pack- A pack which contains all like items, i.e. same part/item numbers.
e. Mixed Item Pack- A pack containing items with different part/item numbers.
f. Subpack-One of the smaller packs (Which may be a standard quantity or non-standard quantity pack) that make up a larger multiple pack.
g. Shipping Pack- A pack used for shipping items from one plant to another and can be any of the packs described above.
h. Label- A card, strip of paper, etc. marked and attached to an object to indicate its nature, contents, ownership, destination, etc.
i. Tag- A label that is hung from an object, usually with a wire placed through a reinforced eyelet in the label/tag.
j. Shipping/Parts Identification Label- A label used to identify the contents of a shipping pack.
k. Master Label- A label used to identify and summarize the total contents of a shipping pack.
l. Mixed Load Label- A label used to designate mixed contents on the same unit load.

7.4. Label Specific Glossary of Terms (Continued)

m. Pack, Package or Load- A unit which provides protection and containment of items plus ease of handling by manual or mechanical means. Examples of containers or packs which normally are disposable bags, cartons, cartons on pallets, pallet boxes and metal tubs, and metal racks/skids.
n. Receiving Location Code - A unique code assigned by Atmus for each plant receiving dock location. (e.g. R/L 022 for Columbus Midrange Engine Plant)
o. Net Wt.: Total weight of product only contained in the package.
p. Gross Wt.: Total weight of shipping unit including product, package and dunnage material. Gross Wt. = Net Wt. + package and dunnage weight.

7.5. Shipping/Parts Identification Label Size and Material

Label size and Label Data Area field dimensions should be as displayed in Figure 11: Shipping/ Parts Identification Label Dimensions and Figure 12: Shipping/Parts Identification Label Dimensions.

The label paper should be white in color with black printing. Adhesive types can be pressure sensitive or dry gummed if adherence to the package substrate is assured and application is wrinkle-free. If the specified label cannot be affixed to packaging/container because of container size or design, special arrangements will be required. (See Section 7.7. Special Labels on page 43).

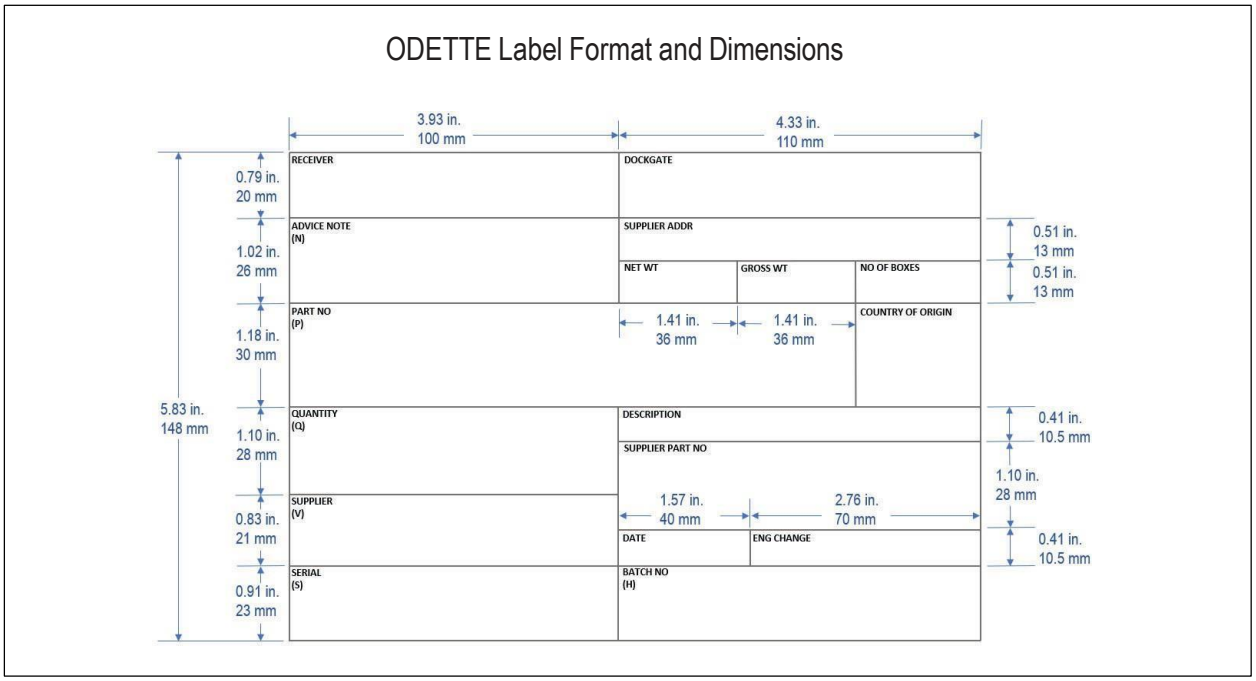


Figure 11: Shipping/Parts Identification Label Dimensions

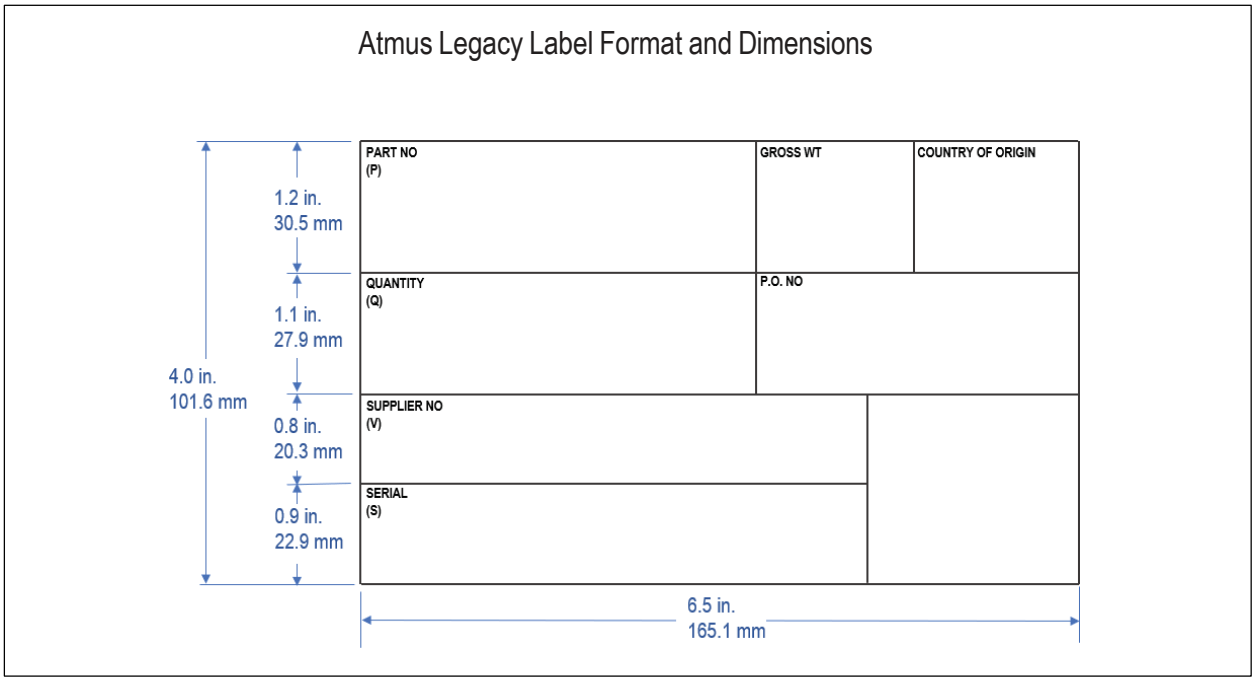


Figure 12: Shipping/Parts Identification Label Dimensions

7.5.1. Shipping/Parts Identification Label Hang Tag Size and Material

The tag size should be the same as described above, plus the material necessary to add a reinforced eyelet to the tag. The tag should be durable enough to assure readability at its destination. (See Figure 13: Shipping/Parts Identification Label Hang Tag on page 40.)

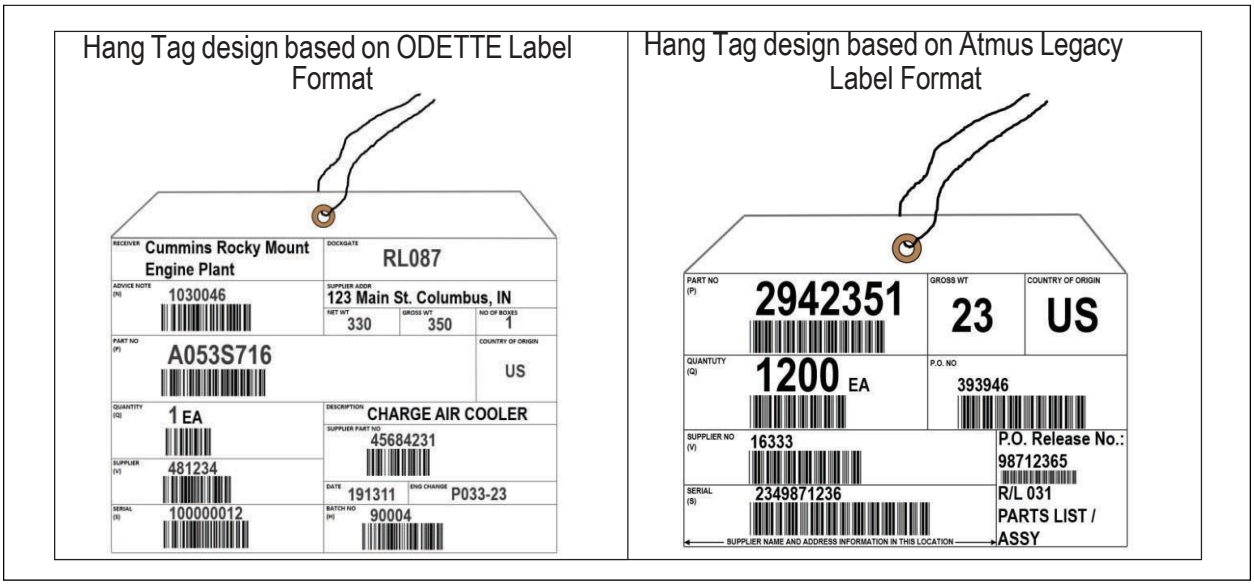


Figure 13: Shipping/Parts Identification Label Hang Tag

Figure 14: Odette Format with Country of Origin Data Location

Figure 15: Legacy Atmus Label with Gross Wt. and Country of Origin

The part number, quantity, supplier number, Dockgate/Receiving Location and label serial number shall be included on each label in the designated data areas and shall be displayed in both human readable characters and bar code symbols. The purchase order number on individual carton labels can be an exception if you are pulling packaged labeled product from stock that you ship to multiple Atmus locations, however, the Master Label shall have the purchase order displayed in human readable characters and bar code symbols. All data may vary in length.

7.6. Bar Code Symbology

7.6.1. Label Identifier Codes

A data identifier code in the first position following the start code of the bar code symbol shall be used to identify the information to follow. This character is not to be included in the human readable line but is shown in the human readable characters under the title for the appropriate data area. Using additional bar code symbols on shipping packages is not encouraged but may be appropriate in some circumstances. To prevent reading wrong data into a system, and to differentiate among all bar code symbols, any added bar code symbols placed on the Shipping / Parts Identification Label shall have data identifiers. Any added bar code symbols placed elsewhere on a shipping package shall also contain a data identifier. The data identifier codes are listed in Figure 16: Label Identification Table on page 42.

Note that the identifiers 'D' and 'E' are reserved for assignments to data that can be made by the Customer and Supplier locations. If a Supplier or Customer wishes to assign different identifiers to more than one data item, double data identifiers can be used, e.g., 'EA' for Supplier's product number, 'EB' for Supplier's inspector number, etc.

All barcodes shall be Code 39

7.6.2. Check Digits

Check digits shall not be added in the bar codes.

7.6.3. Quality Assurance Requirements

It is the responsibility of the supplier to provide barcoded labels that meet these specifications. Equipment is available to verify that bar code symbols meet these requirements. Barcode labeling solutions are available on line by purchasing their software or services to print labels to minimize hardware investment costs.

7.7. Special Labels

While these specifications will cover most situations, there will be circumstances where requirements will dictate special arrangements between Customers and Suppliers. Every effort to minimize these situations should be a goal of all so that complexities and costs are not added.

Two (2) situations where special labels may be needed for better handling are multiple and mixed item packs. They are to be used only when supplier and customer mutually agree.

7.7. Special Labels (Continued)

When multiple or paired part numbers are shipped in the same container, the human readable part numbers for each part packed shall be printed in the Part Number area and the bar code symbols for these part numbers shall not be printed. (See Figure 17: Special Label on page 44).

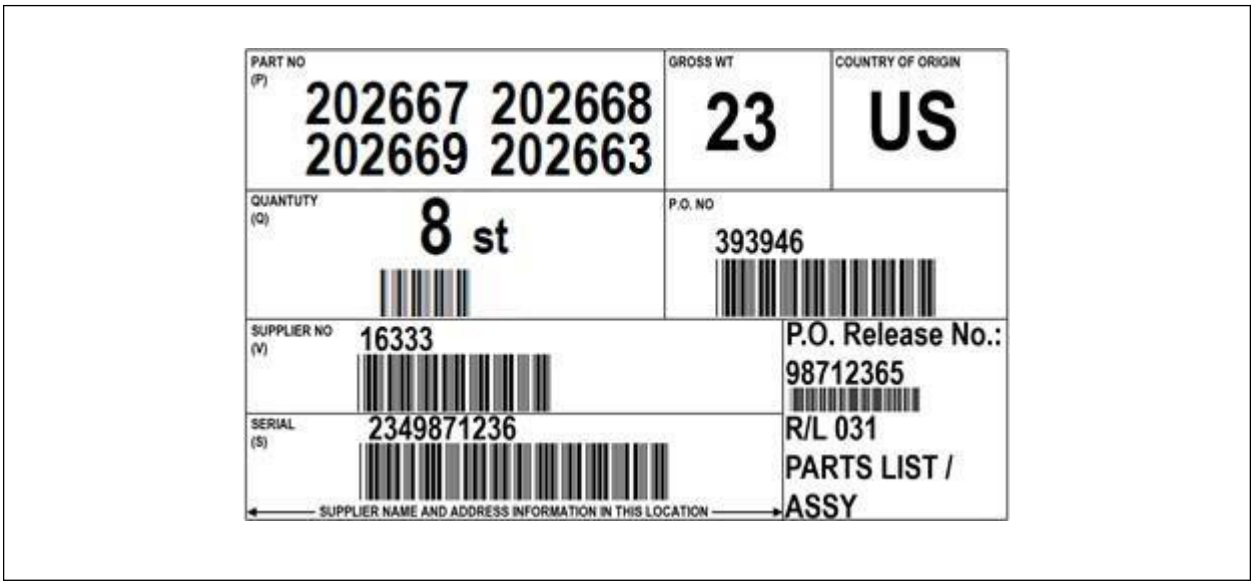


Figure 17: Special Label

7.7.1. Multiple, Common Item Packs

A Master Label, as shown in Figure 18: Master Label on page 45 shall be used when the total contents of a multiple, common item pack is to be identified. Each sub-pack of the multiple pack shall be identified with a Shipping/Parts Identification Label. The total multiple pack shall be identified with a Master Label on 2 sides of the unit load. To the extent possible, the label should be placed on a pack in such a manner that when the pack is broken apart the label is discarded (e.g., hang Master Label from banding or stretch wrap, shrink-wrap or on outside of an over-pack pallet carton.)

7.7.1. Multiple, Common Item Packs (Continued)

At the top of this label, the heading "Master Label" shall be printed in bold 1.0 in. (25.4 mm) letters. The balance of the label format shall conform to the specifications of the Shipping/Parts Identification Label except that the data identifier for the serial number shall be (M) instead of (S). The serial number, preceded by an "M" in the bar code form only shall be a unique number, not to be repeated over the course of a year. The quantity on the master label shall be the total in all the subpacks.

Purchase Order Number is a required field by Atmus Inc. for "Master Label". The human readable purchase order number shall be a minimum of 0.2 in. (5 mm) high. The bar code symbol of the purchase order number shall be directly below the human readable characters and shall be a minimum of 0.5 in. (13 mm) high. The maximum length anticipated for the purchase order number is eight (8) characters plus the data identifier (K).

Figure 18: Master Label

7.7.2. Mixed Item Loads

Mixed Item loads shall have a label with the words “Mixed Load” in bold 1.0 in. (25.4 mm) letters attached in a noticeable location on the pack/container. Two alternative label designs are specified; one generic designed to alert the site that mixed materials are enclosed and one that identifies the supplier and serialized information.

Each sub-pack or item shall be identified with a Shipping/Parts Identification Label as referenced above.

See Figure 19: Mixed Load Label Examples on page 46 for both label examples.

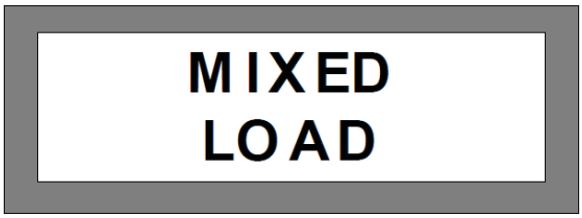
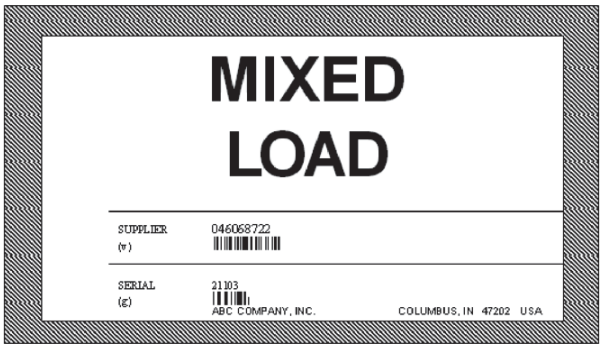
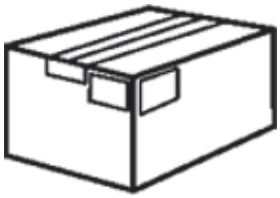
Generic Mixed Load Identification Label	Mixed Load Identification Label w/ Supplier and Serial Data Fields
	

Figure 19: Mixed Load Label Examples

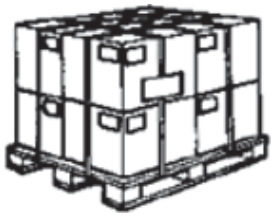
7.7.3. Label Location

Illustrations of the most common shipping packs and recommended label locations are shown in Figure 20A: Label Location Examples, Figure 20B: Label Location Examples and Figure 20C: Label Location Examples. In most cases two labels are specified. The bottom edge of the label shall be parallel to the base of the package/container.

To facilitate automatic reading of bar code symbols, the top edge of the label, where possible, should be no closer than 0.5 inches from the top of the container. Wraparound labels are acceptable as long as quiet zones are within specifications.



%R[RU &DUWRQ
,GHQWLFDO ODEHO VKRXOG EH ORFDWHG RQ WZR DGMDFHQW VLGHV (ZUDSDURXQG ODEHO DFFHSWDEOH).



&DUWRQ RQ 3DOOHW
(DFK FDUWRQ VKDOO EH LQGLYLGXDOO\ ODEHOHG DV GLUHFWHG DERYH. 2QH 0DVWHU /DEHO PD\ EH XVHG RU RQH 0L[HG /RDG /DEHO DV GHVFULEHG DERYH.

'UXPV, %DUUHOV RU &\OLQGULFDO &RQWDLQHUV
,GHQWLFDO ODEHOV VKDOO EH ORFDWHG RQ WKH WRS DQG QHDU WKH FHQWHU RI WKH VLGH.

Figure 20A: Label Location Examples

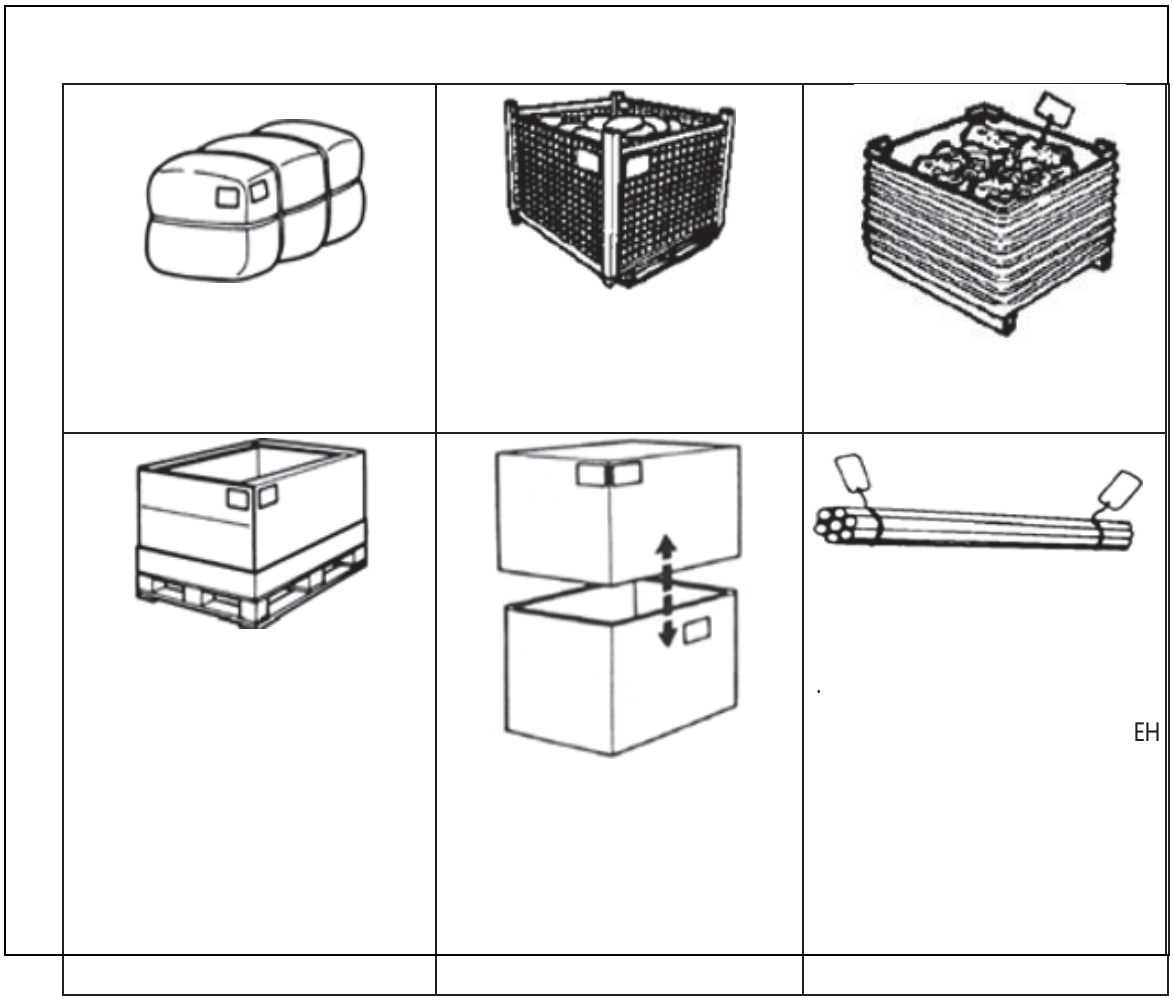


Figure 20B: Label Location Examples

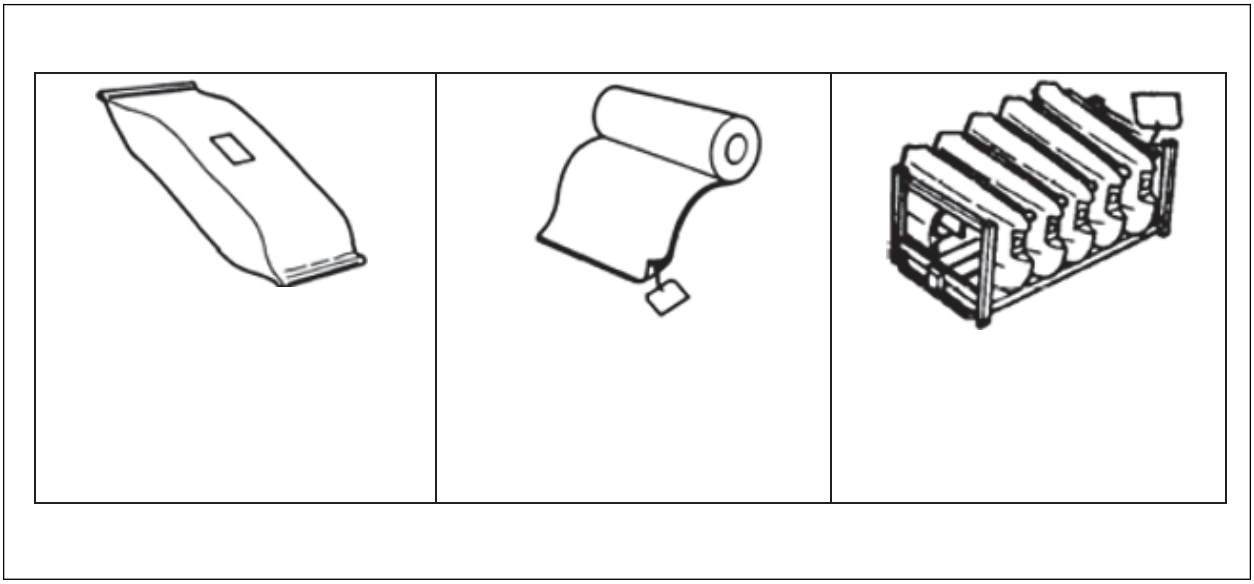


Figure 20C: Label Location Examples

8. Ergonomics and Sustainability

The following guidelines shall be used in establishing the right-sized container, type, part orientation, and ergonomics:

a. Containerization and packaging methods shall optimize pack density with consideration for part quality, ergonomics, and cost. Atmus Ergonomic Standard contains full ergonomic design guidelines. This document can be found on the Atmus Supplier Portal.
b. Part orientation for ergonomic presentation shall optimize the operator's grasp, lift, manipulation and part transfer to the work. Operators should be able to grasp and lift the part from the packaging while maintaining neutral postures.
c. Part orientation in the container shall utilize the relative location to the container label as a reference for consistent presentation at line-side.
d. Parts should be presented in the same orientation as they are assembled or worked to minimize part handling.

8. Ergonomics and Sustainability (Continued)

e. Where dunnage is required, its orientation within the container shall be consistently applied such that the part-to-shipping label relationship is maintained.
f. Dunnage should include hand coupling design and orientation of handles to allow for power grip and neutral postures. Where incorporated, ideal handle length is 5" minimum and hand hold cutout is 4.5" minimum. Dunnage shall be designed to allow hand access to properly grasp the parts. When designing for hand clearance, gloves should be considered.
g. Dunnage should be used to prevent part shifting.
h. Manually handled containers are the preferred method of packaging when an ergonomic advantage can be realized by a decreased reach or lift distance. Manually handled containers are preferred over bulk style packaging for their contribution to small lot strategy and the ergonomic advantage of reduced reach and lift distance.
i. Any packaging which could exceed the weight guidance should be designed with consideration for lift assists or equipment.

9. Reference Readings

The following references were used in the preparation of this standard.

a. AIAG B1, Bar Code Symbology Standard
b. ANSI ASC X12.3, Data Element Dictionary

Appendix A: Packaging Glossary of Terms

Table A1: Packaging Glossary of Terms

Term	Definition
3PL	Third Part Logistics Services
4-way entry	A pallet whose configuration permits insertion and withdrawal of handling equipment from all sides of the pallet.
Adhesives	Materials capable of adhering one surface to another. As used in connection with fiber boxes: a material to glue piles of solid fiberboard, to glue facings to corrugating medium in combined corrugated board, to glue the overlapping sides of a box forming the manufacturer's joint or to glue the flaps in closing a slotted box.
AIAG	Automotive Industry Action Group
Angle Board	Corner Board or Angle Board used to protect packaged products during storage or shipment. They are used to protect freight from dents, strapping, stretch film, and other shipping and handling damage. Also to improve stack strength.
APQP	Advanced Production Quality Planning, a methodical process used to introduce new or changed products & processes.
Assurance Level	The test intensity for packaging based on the level one wants to achieve in package performance. For an average level of assurance, one may use Level II with medium test intensities; for highest level of assurance, Level I; and for the lowest level of assurance, Level III.
Bill of Lading	A detailed list of a shipment of goods in the form of a receipt given by the carrier to the person consigning the goods.

Appendix A: Packaging Glossary of Terms (Continued)

Table A1: Packaging Glossary of Terms (Continued)

Term	Definition
Block Risers	Rectangular, square or cylindrical deck spacer, or blocks between the pallet decks or beneath the top deck, often identified by its location within the pallet as corner block, end block, edge block, inner block, center or middle blocks.
Bulk Pack	A container in or on which multiple like parts are packaged and used as a single container and does not contain multiple primary containers of parts.
Class “A” Surfaces	Term used in automotive design to describe a set of free form surfaces of high efficiency and quality.
Closed Crating	A container with structural framework and panel members fastened together to form a rigid enclosure. The panels used to create this enclosure can be made of corrugated paper, plywood, OSB or any product strong enough to perform containment of given products. Closed crating boxes are fully enclosed and can have any section (i.e. side, end, top, base and cap) removable for filling.
Closure	A means of closing a container to secure the contents.
Container fleet size	Number of containers necessary to support a given returnable system flow from and return to point of origin.
Corner Posts	A structural support member placed inside or outside of the corners of unit load or carton to improve stacking capacity.
Corrosion Inhibitors	A media used to inhibit oxidation of ferrous and non-ferrous metals.
Corrugated packaging material	The structure formed by gluing one or more sheets of fluted corrugating medium to one or more flat facings of liner board. Sometimes inaccurately called cardboard.

Appendix A: Packaging Glossary of Terms (Continued)

Table A1: Packaging Glossary of Terms (Continued)

Term	Definition
Cube Utilization	Cube utilization is an industry term that refers to the amount of the total available space that is utilized, expressed as a percentage. When a space is completely filled with product, the cube utilization is 100%. This term is valid in secondary, tertiary or truck/container loading.
Atmus receiving site	The Atmus site location specifically receiving the parts that are supplied by the Supplier.
Cycle counting	A cycle count is an inventory management procedure where a small subset of inventory is counted on specified intervals to validate physical counts match system balances.
Deck board	Element or component of a pallet deck, oriented perpendicular to the stringer or stringer board.
Deck board spacing	Distance between adjacent deck boards.
Desiccants	A drying agent used to quickly reduce the humidity inside a closed container to a predetermined lower value, and then to keep the humidity at that lower level for a period of time.
Double Wing	Pallet style that has top and bottom deck boards that extend over the stringers of a pallet.
Dunnage	Devices or materials used to orient, secure and/or protect goods during shipment.
Dynamic environment	State in which product is in motion such as in a freight transport event.
Expendable packaging	Packaging material intended primarily for a one-time use, then disposition as; reuse, recycle or discard.

Appendix A: Packaging Glossary of Terms (Continued)

Table A1: Packaging Glossary of Terms (Continued)

Term	Definition
Failsafing	Method for inherently error proofing an action or result.
Fleet Size	The number of container days in a returnable container system allocated to the combined Supplier and Atmus receiving size flows.
Float days	The number of container days in a returnable container system allocated specifically to the Supplier side flows.
Foot Print	The length and width dimensions of a specific package or unit load.
GPS Website	Global Purchasing System Website where Suppliers can access information and requirements regarding Purchasing and Packaging Standards.
IPPC	International Plant Protection Convention: A group within the United Nations that works together to reduce the spread of plant pests and diseases. The ISPM 15 rules were developed by the IPPC.
Isometric	A method of technical drawing projection in which a three-dimensional object is represented.
ISPM-15	International Standard for Phytosanitary Measure No.15. An International Plant Protection Commission's (IPPC) global regulation governing approved measure for insect eradication from solid timber packaging materials used in international trade. Usually done through an approved Heat Treat or Fumigation process.
JISK0303	Japanese Industrial Standard for regulation of formaldehyde air born concentration threshold for manufactured wood materials.

Appendix A: Packaging Glossary of Terms (Continued)

Table A1: Packaging Glossary of Terms (Continued)

Term	Definition
Label placards	A device providing a reusable label holding surface, where one-time use labels can be quickly applied and removed with no label residuals.
Line side presentation	Method of part and/or packaging is introduced to the assembly line or a lean manufacturing assembly station for use.
Manufactured wood	Wood materials produced from a man made process using raw timbers to create plywood, Oriented Strand Board (OSB), Layered Veneered Lumber, Layered Strand Board, Pressed Wood, etc.
Metal Stitches	Machined formed fastening device using wire drawn from a spool.
Mixed Load	A unit load consisting of more than one part number of packaged parts.
Modularity	The concept of joining together standardized packaging units to form larger compositions that will provide efficiency in the packaged unit and mode of transportation.
Nested	The configuration of stacked items such that each successive item is contained to some degree within the next.
NIOSH	National Institute for Occupational Safety and Health, a United States governing body covering occupational, health and safety regulations.
NWPCA	National Wood Pallet and Container Association, a North American organization that set and governs standards for wood pallet and wood container construction and materials.
Open Crating	A wood container with structural framework fastened together to form a rigid support structure.

Appendix A: Packaging Glossary of Terms (Continued)

Table A1: Packaging Glossary of Terms (Continued)

Term	Definition
Overhang	That portion of the part/carton/unit load that extends beyond the width or length dimension of pallet. (Not allowable.)
Over-pack	A large/secondary container into which smaller primary container(s) are packaged.
Palletization	Stacking and securing of containers on pallets for shipment as a unit load.
Phytosanitary	Free from harmful pests and plant diseases. Reference ISPM 15.
Plan-For- Every-Part (PFEP)	A process that defines and optimizes the containerization and material flow characteristics of a packaged part, including part orientation, standard pack quantity (right sized pack), pack dimensions & weight, lineside presentation, delivery frequency, etc.
Point of origin	Location or station where Atmus takes ownership of the goods.
Point of use	Location or station where a product or component will be consumed.
Poly-bag	Plastic film bag consisting of any thermal plastic polymer or combinations there of.
Pre-Consumer Recycled Material	Pre-consumer material (also known as in-process) is waste generated in the manufacturing process, and used again to make the same material or product.
Post-Consumer Recycled Material	Post-consumer content comes from a finished product that was purchased by a consumer and used, and then recycled after it is used to make a new product and diverting it from going into a landfill.

Appendix A: Packaging Glossary of Terms (Continued)

Table A1: Packaging Glossary of Terms (Continued)

Term	Definition
Production Parts Approval Process (PPAP)	A process to document the initial quality planning work required to prevent problems from occurring during production.
Primary container	The smallest unit of containerization of the packaged part.
Recyclable Material	Material that may be reprocessed for use as raw material.
Returnable Containers	A shipping container specifically designed for long term return and reuse over the product life cycle.
Runner	See Stringer. A part of a pallet that is the same as Stringer.
S Review	Purchasing Readiness Review Process when sourcing a new supplier.
Secondary Container	A container in which one or more primary containers are packaged.
Shiner	Protruding fastener with points that extends outside the wood pallet, crate or box.
Shrink wrap	Plastic film that is applied to a package or product that is then passed through an oven or other heating device to shrink the plastic film around the item.
Solid timber	Homogeneous raw wood packaging material (e.g. solid boards or planks).
Static environment	State in which product is motionless such as in a warehouse environment.
Stretch wrap	Plastic film that is applied to a package/product that is elongated and wrapped around a unit load in several overlapping revolutions to securely unitize a pallet load of product.

Appendix A: Packaging Glossary of Terms (Continued)

Table A1: Packaging Glossary of Terms (Continued)

Term	Definition
Stringer	A continuous longitudinal member that supports the decks of a pallet.
Unit load	Multiple cartons or bulk packaged items assembled into a single packaged container or structure for handling, storage, and transportation.
VCI	A chemical vaporization process used to retard or prevent corrosion of ferrous and non-ferrous metals. Commonly referred to as “Volatile Corrosive Inhibitor”.

Appendix B: Production Component Packaging Guideline - Solid Timber Closed Crating

B1. Scope

This document specifies recommended construction and dimensional standards for solid timber crate packaging for both US domestic and international applications. The intent of these standards is to provide standardization, reduce product damage, and prevent safety-related incidents resulting from pack failures. This document contains guidelines that will navigate the user to select the optimal packaging solution recognized by Atmus. The guidelines will take various parameters (e.g. size, weight, containment) into account to reach the end solution.

B2. Methodology

These guidelines were formulated as a result of combined research of various packaging styles, regionally available materials and manufacturing capabilities, transportation conditions, and industry recognized testing procedures. Once acceptable solutions were defined, these solutions were subjected to rigorous transport testing (ASTM D4169, Assurance Level 1– Drop/ Vibration/ Impact) and reviewed with multiple stakeholders to ensure successful implementation.

B3. Construction Details

The details below include all reference information necessary to navigate through the guidelines when selecting the required packaging solution.

B3.1. Material – All solid wood used shall adhere to the ISPM 15 requirements and contain no more than 14% moisture. The following material is acceptable to use during the construction of the packaging solutions:

a. Hardwood Species – (e.g. – oak, aspen, maple, poplar, ash, cottonwood, locust).
b. Softwood Species – spruce, pine, fir.
c. Plywood – E0 or E1 grade plywood is acceptable to use for the wall components only (sides, ends and tops). If plywood is chosen for wall component, it does not need to be slatted. (See Figure B1: Plywood Crate.)

Appendix B: Atmus Production Component Packaging Guidelines - Solid Timber Closed Crating (Continued)

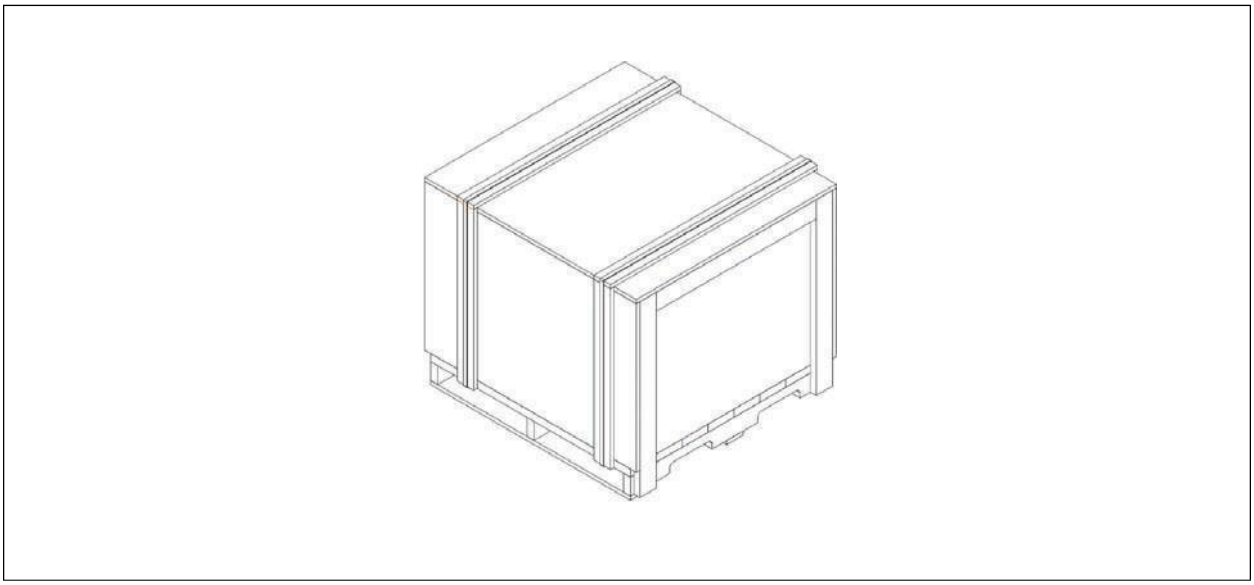


Figure B1: Plywood Crate

B3.2. Fasteners

a. Type – Helical, smooth shank, and ring shank nails are acceptable fasteners to use during the construction. Screws are also allowed as long as they meet the engagement requirement. Staples are not acceptable fasteners.
   CAUTION: Protruding nails or screws are called "Shiners". From a Safety Standpoint "Shiners" are not permitted in order to avoid personal injury during handling.
b. Engagement – The fastener engagement of two members shall be at least 75%. (E.G. when nailing a 0.75" (19.05 mm) thick panel to a 1.5" (38.1 mm) cleat, the minimum length of the fastener shall be 1.5" (38.1 mm) to provide adequate engagement.
c. Tops shall be fastened with screws for ease of unpacking and customs inspection.
d. Fastening product to base – If product is to be fastened to base, the supplier shall use deck material with a minimum thickness of 1.5" (38.1 mm) and shall not protrude the deck which can cause stripping.

Appendix B: Atmus Production Component Packaging Guidelines - Solid Timber Closed Crating (Continued)

B3.2. Fasteners (Continued)

Footprint Sizes – In order to maximize transportation cube utilization and minimize lateral impact while in transit, the footprint of the crate shall contain at least one of the following dimensions (See Table B1: Footprint Sizes on page 61). In the event this requirement cannot be met, the supplier will be required to contact its Atmus packaging representative for approval prior to implementation.

Table B1: Footprint Sizes

International (90" wide Ocean Container)		US Domestic (96" wide Van)	
Imperial (inch)	Metric (mm)	Imperial (inch)	Metric (mm)
15	381	20	508
18	457.2	24	609.6
22.5	571.5	32	812.8
30	762	48	1219.2
45	1143	96	2438.4
90	2286		

B3.3. Banding – One-way banding is required on all crates. Preferred banding material shall be polyester with a minimum width of 0.75" (19.05 mm). No steel banding permitted. Banding shall be aligned on cleats and battens if present. If lack of wall strength over a large span is a concern, a center band can be placed to either side of the center runner.

B3.4. Crate capacity – The following three duty levels are to be followed:

a. Light Duty (≤ 1000 lbs/ 453 KG)
b. Medium Duty (1000 - 2500 lbs/ 453 - 1133 KG)
c. Heavy Duty (2500 - 4000 lbs/ 1133 - 1812 KG)

Appendix B: Atmus Production Component Packaging Guidelines - Solid Timber Closed Crating (Continued)

B3.5. Component Details

a. Walls (top, side and end members) – Wall boards should have a minimum width of 3.5" (88.9 mm) A combination of various widths are acceptable as long as there are no gaps between slats. If there are concerns with wall strength with a large span, a center cleat can be placed to provide additional lateral support.
b. Cleats – Cleats integrate with the walls that parallel with the runners. Sides and tops shall be secured by fasteners to the end of the cleats, and the cleats shall be fastened to the side of the runners.
c. Decks – If the crate has a large span and there are concerns with the deck strength utilizing the specific deck size board thickness specified per the weight class chart in Figure B3: Crate Components Size, the supplier shall utilize a larger size deck board thickness to accommodate the application.
d. Battens – Battens strengthen the girth of the crate parallel with the runners. Banding straps shall be placed over the battens. Battens are to be placed no more than 2" (50.8 mm) from the edge of the runner to prevent band sheering from fork tines.
e. Runner Strips – Runner strips (lower deck boards) are required if the supplier chooses to use a runner with a thickness less than 2.5" (63.5 mm) to prevent runner sheering/ buckling. Runner strips shall be a minimum of 0.5" (12.7 mm) (See Figure B2: Runner Strips).

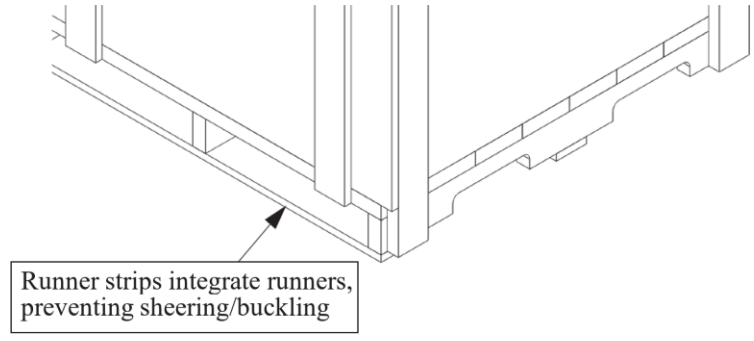


Figure B2: Runner Strips

Appendix B: Atmus Production Component Packaging Guidelines - Solid Timber Closed Crating (Continued)

B3.6. Crate Components

Crate Duty	Light		Medium		Heavy	
	(≤ 1000 lbs)	(≤ 453 KG)	(1000-2500 lbs)	(453-1133 KG)	(2500-4000 lbs)	(1133-1812 KG)
Wall (min)	.5 x 3.5"	12.7 x 88.9 mm	.75 x 5.5"	19.05 x 139.7	.75 x 5.5"	19.05 x 139.7 mm
Deck (min)	.5 x 3.5"	12.7 x 88.9 mm	1 x 3.5"	25.4 x 88.9 mm	1.5 x 3.5"	25.4 x 88.9 mm
Runner (min)	1.5 x 3.5"	38.1 x 88.9 mm	2.5 x 3.5"	63.5 x 88.9 mm	3.5 x 3.5"	88.9 x 88.9 mm
Cleat (min)	1 x 2"	25.4 x 50.8 mm	1.25 x 2.5"	31.75 x 63.5 mm	1.5 x 3.5"	38.1 x 88.9 mm
Batten (min)	.75 x 2.5"	19.05 x 63.5 mm	.75 x 2.5"	19.05 x 63.5 mm	1 x 3.5"	25.4 x 88.9 mm

Figure B3: Crate Components Size

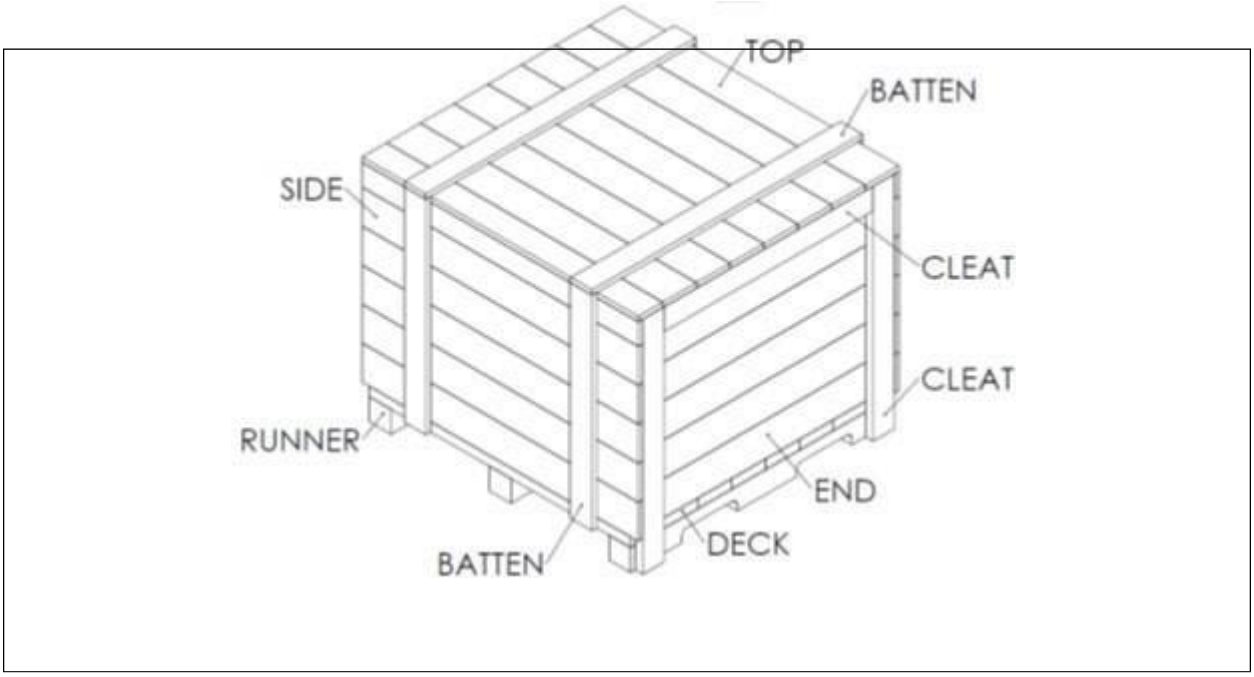


Figure B4: Crate Components

Appendix B: Atmus Production Component Packaging Guidelines - Solid Timber Closed Crating (Continued)

B3.7. Construction Method

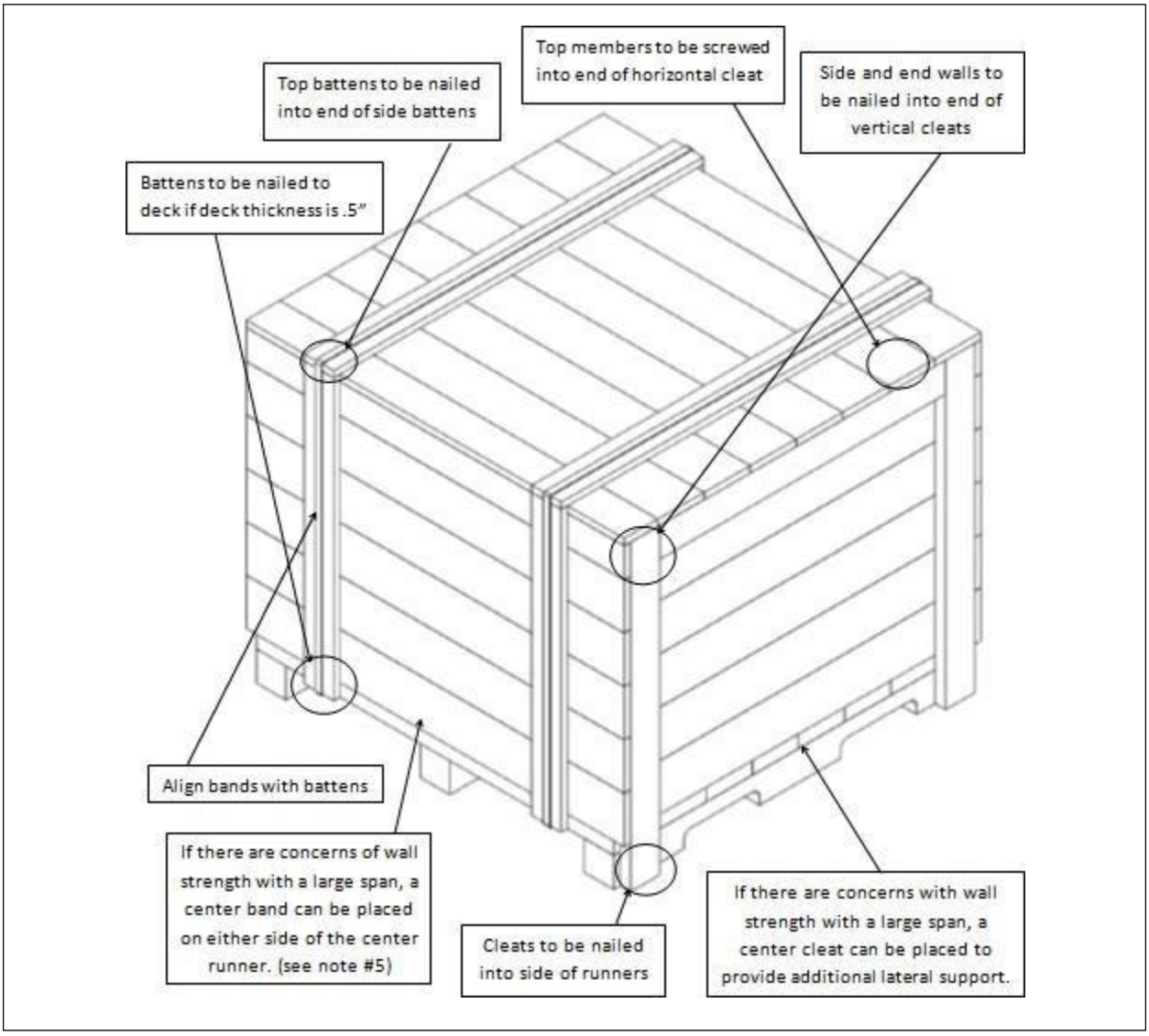


Figure B5: Construction Method

Appendix C: Packaging Data Sheet (PDS)

The Packaging Data Sheet (PDS) is to be filled out and returned to the **Atmus Sourcing Manager.**

Example graphics of the PDS form may not be to the latest revision level. Suppliers are to obtain the currently released revision of the PDS template from the Atmus Supplier Portal.

The PDS contains two data input tabs which shall be completed in full. These tabs are the Packaging Specification Data Sheet (PSDS) and Packaging Cost Data Sheet (PCDS).

Additionally, the Check Requirements tab may be used as a reference to ensure all standard requirements have been met in the proposed design concept.

Find the PDS form on The Atmus Supplier Portal. [Partnering with Atmus | Atmus]

Appendix C: Packaging Specification Data Sheet (Continued)

Packaging Standard Data Sheet

COMPONENT INFORMATION					
Part Number		Rev. Level		Submission Level	
Part Name		Rev. Date			
Package Quantity		ourcing Manag			PPAP
SUPPLIER INFORMATION					
Company Name	Atmus Filtration Technologies	Supplier ID NO.			
Supplier Address	1200 Fleetguard Rd	Packaging Contact			
	Cookeville, Tn 38501	Phone Number			
		Email Address			

COMPONENT ASSEMBLY INSTRUCTION (As Needed)

PACKAGING LAYOUT DATA

Packaged Component Assembly	Packaged Components Matrix	Packaging Componet Name	Part Number	Quantity
		Packaged Assembly Dimensions	Length (mm) / Width (mm)	Height (mm)

Label Position(s)	Method of Load Securement	
	Banding	
	Stretch Wrap	
	Angle Board	
	Other - Describe	
	Estimated Weight Calculations (lbs)	
	Part Weight	
	Dunnage Tare	
	Pallet Tare	
	Unit Load Gross (Approximate)	0

Label Information	Shipping Label - Required	Core Label - Example	Traceability ID - Lot Date:
			XXXYYDDD###-@
			XXX — Media Grade (881)
			YY — Last 2 Digits of Year
			DDD — Julian Date
			### — Roll Number
			@ — Slit: 1 = Left (NOP) ; 2 = Right (OP)
			Example
			88124110002-1
			881 — Media Grade for NNP3
			24 — Year 2024
			110 — 04/20 on Julian Date 2024
			002 — Second 881 roll on 04/20/24
			1 — Left side slit

Core Label - Required		Notes for Slit #
- Atmus Part Number Required - Vendor Name Required - Customer PO # Required - Lot Date & Slit Cut # Required	Attach core labels inside the core such that it cannot be easily removed. It is recommended to use small 1.5 x 3 inch adhesive back labels for the core label. Other vendor label information is allowed.	The NOP side of the meltspun material is in Slit #1 of the laminated roll. The OP side of the meltspun material is in Slit #2 of the laminate roll.

Figure C1: Packaging Specification Data Sheet (PSDS) Form

Appendix C: Packaging Specification Data Sheet (Continued)

Label Position(s)		Method of Load Securement	
		Banding	
		Stretch Wrap	
		Angle Board	
		Other - Describe	
		Estimated Weight Calculations (lbs)	
		Part Weight	
		Dunnage Tare	
		Pallet Tare	
		Unit Load Gross (Approximate)	0

Label Information	Shipping Label - Required

Atmus Filtration Receiving Location - Contact Information			NOTES FOR OPTIONAL PACKAGING
Plant Name (s)	Atmus Cookeville Plant		
Address	1200 Fleetguard Rd		
Address			
City	Cookeville		
State	TN		
Country	USA		
Phone No.			
Email			

Atmus Filtration Approvals			
Functional Area	Approver Name/Signature	Approver Name/Signature	Optional Approver Comment(s)
SQI Engineer			
Plant Quality			
Materials			
Operations			
Supplier Representative			

Figure C2: Packaging Specification Data Sheet (PSDS) Instructions

Packaging Standard Data Sheet

Atmus FILTRATION TECHNOLOGIES

COMPONENT INFORMATION					
Part Number		**Rev. Level**		**Submission Level**	
Part Name		**Rev. Date**			
Package Quantity		**purcing Manag**			PPAP
SUPPLIER INFORMATION					
Company Name	Atmus Filtration Technologies	Supplier ID NO.			
Supplier Address	1200 Fleetguard Rd	Packaging Contact			
	Cookeville, Tn 38501	Phone Number			
		Email Address			

COMPONENT ASSEMBLY INSTRUCTION (As Needed)

PACKAGING LAYOUT DATA

Packaged Component Assembly

Packaged Components Matrix

Packaging Component Name	Part Number	Quantity

Packaged Assembly Dimensions	Length (mm)	Width (mm)	Height (mm)

Label Position(s)

Method of Load Securement	
Banding	
Stretch Wrap	
Angle Board	
Other - Describe	

Estimated Weight Calculations (lbs)	
Part Weight	
Dunnage Tare	
Pallet Tare	
Unit Load Gross (Approximate)	0

Label Information

Shipping Label - Required

Core Label - Example

Traceability ID - Lot Date:	
XXXYYDDD###-@	
XXX	Media Grade (881)
YY	Last 2 Digits of Year
DDD	Julian Date
###	Roll Number
@	Slit: 1 = Left (NOP) ; 2 = Right (OP)
Example	
88124110002-1	
881	Media Grade for NNP3
24	Year 2024
110	04/20 on Julian Date 2024
002	Second 881 roll on 04/20/24
1	Left side slit

Core Label - Required

- Atmus Part Number Required
- Vendor Name Required
- Customer PO # Required
- Lot Date & Slit Cut # Required

Attach core labels inside the core such that it cannot be easily removed. It is recommended to use small 1.5 x 3 inch adhesive back labels for the core label. Other vendor label information is allowed.

Notes for Slit #

The NOP side of the meltspun material is in Slit #1 of the laminated roll. The OP side of the meltspun material is in Slit #2 of the laminate roll.