Rolls-Royce Solutions America Inc.

North America Packaging Guidelines

By Rolls-Royce Solution America Packaging Engineering
Revision 01

Contents

1.0 Forward

The following packaging and identification requirements are part of the terms and conditions of a supplier's purchase order contract with Rolls-Royce Solutions America Inc. (RRSA)

2.0 Scope

The purpose of this publication is to achieve a quality packaging system through a cooperative effort between our suppliers and RRSA that will:

- Contain and protect the production parts
- Increase productivity
- Improve competitiveness
- Reduce packaging cost
- Reduce handling cost
- Improve safety
- Reduce waste

This publication was prepared by the RRSA Logistics Department in cooperation with manufacturing and assembly operations to provide workable solutions for both our operations and for those of our suppliers. RRSA emphasizes the development of complete and efficient packaging systems through communication, planning and implementation. Each supplier must adequately plan for packaging in advance. We encourage suppliers to work with the packaging group for packaging improvements. Normal changes in plant facilities, part designs, and packaging materials require constant attention to assure the consumption process needs are met as economically as possible. The supplier ***must*** submit new forms detailing changes and communicate packaging changes in advance for proper preparation. The supplier ***must*** contact the relevant packaging department to communicate packaging changes in advance for proper preparation.

This publication North America Packaging Guidelines, Revision 01 replaces all previous packaging guidelines including, but not limited to CD-TMGL-002, CD-TFL-001, DD5563-9604 and DD5563-9902

Questions related to RRSA packaging and labeling should be directed to the packaging department (packaging@ps.rolls-royce.com for production parts, packaging.brownstown@ps.rolls-royce.com for After Sales parts and packaging.mankato@ps.rolls-royce.com for Mankato parts). This entire document also covers After Sales parts packaging. A few specific items pertaining to After Sales packaging are also covered in section 8.

3.0 Transportation Routing Instructions

Refer to the Rolls-Royce America routing instructions prior to shipping material. For questions or support Aiken and Brownstown- Contact: transportation@ps.rolls-royce.com. Mankato: Mankato.Logistics@ps.rolls-royce.com

4.0 General Packaging Requirements

4.1 Safety

- All packaging must be free from handling hazards (protruding nails, loose banding, staple, etc.).
- Staples are permissible if their removal is **not** required to open the package.
- All packaging must be safe and ergonomically friendly to handle in term of weight and size.

4.2 Import/Export

Certain restrictions and regulations apply to packaging material that is shipped between countries. It is the supplier's responsibility to ensure all shipments meet the importing country's import regulations.

4.3 Package Design

All part quotations are to assume expendable packaging. Suppliers are responsible for designing their own expendable packaging, including expendable dunnage used inside a returnable container. RRSA Packaging Department will assist in developing acceptable shipping containers on request or in certain circumstances. Approval of the proposed pack must be made prior to the first shipment. **Supplier is responsible for packaging performance. Test ship if necessary.**

4.4 General Requirements

The following guidelines are requirements to be used by suppliers in developing packaging for all RRSA parts, including production parts:

- No more than one-part number per container.

- One standard pack quantity will be established for each part number. This pack quantity must be used for every shipment regardless of whether the part is shipping in returnable or expendable packaging.
- Orient parts in the pack to make them easily handled at the assembly line.
- Keep the parts clean, corrosion free and ready for assembly or machining. See section 6.0 for more on part cleanliness and preservation.
- Each part must have an expendable pack designated and approved prior to production. This includes any part number that will predominately be shipped in returnable containers.
- Containers must be palletized to permit handling with fork-trucks and pallet-jacks. One full layer of cartons is sufficient volume to require parts to be palletized.
- All pallet loads should be properly secured with stretch wrap, banding or other means.
- Properly identify materials. All materials being received shall be labeled according to North America Container Label Specification.
- Suppliers must provide a primary packaging contact to ensure any packaging issues are addressed and resolved promptly.
- Suppliers may **not reuse** any expendable packaging materials previously used in other shipments, unless approved by Rolls-Royce Solutions America packaging department.
- For shipment labeling requirements, refer to section 7.0
- RRSA has the option, if necessary, of approving or rejecting a supplier's selection of packaging materials and sources.
- Any pallet load that is leaning, bulging, unstable or over hanging will not be acceptable.
- All pallet loads must be adequately banded or secured to prevent shifting in handling and transportation

4.5 Proper Palletization

Each shipping unit must be properly palletized in level layers to allow for stacking and proper utilization of transportation.

It is **mandatory** that when a supplier ships in material warranting palletization, that the parts or materials be loaded on a pallet or packaged as a unit load. The load should not exceed the optimum pallet height of 45".

Footprints & Entry:

Three standard footprints are allowed:

Entry	Width		Length
2	30”	x	32”
4	40”	x	48”
4	45”	x	48”

Usage of anything outside the allowed footprints requires Rolls-Royce Solutions America Inc. **authorization.**

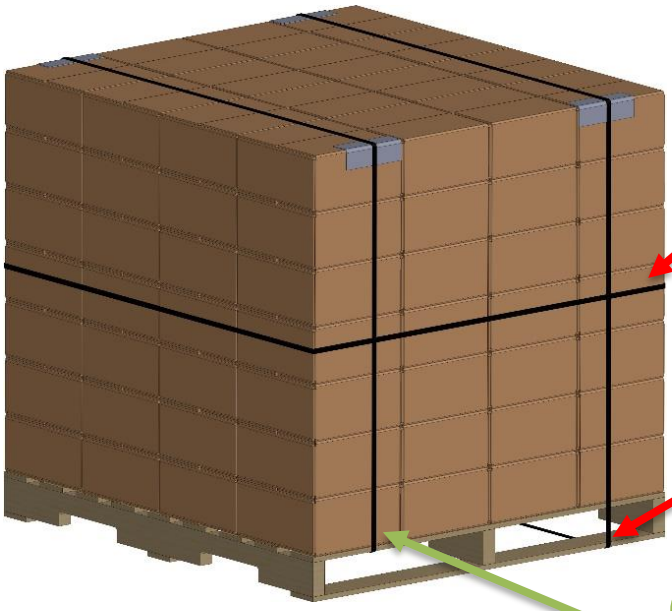
RRSA has the option, if necessary, of approving or rejecting a supplier’s selection of packaging materials and sources.

4.5.1 Stretch Wrap

- Stretch wrap must be clear and allow barcode scanners to scan.
- When using stretch-wrap, DO NOT wrap two pallets, racks, pallet boxes together. These units need to be handled on a one load each basis.
- When stretch wrapping a pallet, securely capture the pallet when wrapping the bottom layer. Wrap the entire pallet load (pallet + product) from top to bottom a minimum of three times, heavier loads may require more.
- Stretch wrapping over pallet entries is prohibited.

4.5.2 Banding

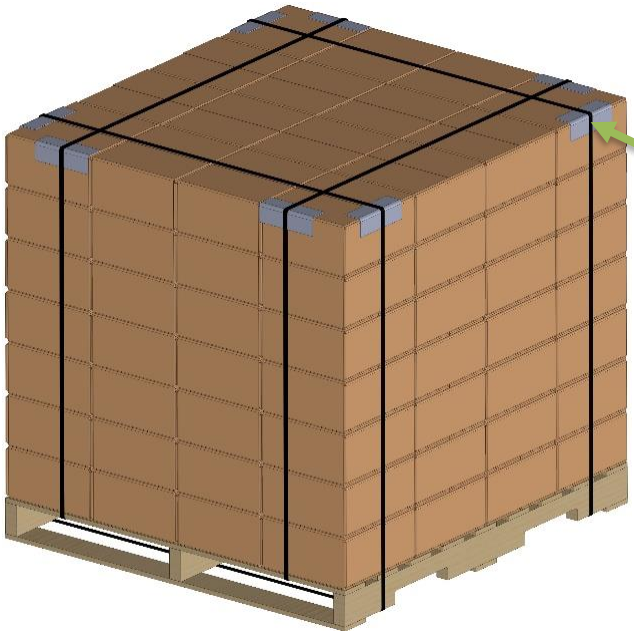
- All cartons must be secured to the pallet, a minimum of 4 bands are required in order to avoid carton shifting during transit.
- Loads secured to pallets with strapping must use edge protectors to prevent straps from cutting into cartons.
- Strapping must be tight and kept as close to the load as possible to avoid deck board damage/breakage. This may require running the strapping between deck boards rather than the edge of the pallet.
- Metal banding is strictly prohibited on the corrugated packs
- Belly banding is strictly prohibited.
- Do not strap more than one pallet deep together.
- Do not tighten straps to the point of crushing the cartons on the pallet.



INCORRECT
Belly banding is strictly prohibited

INCORRECT
Banding must not restrict access to

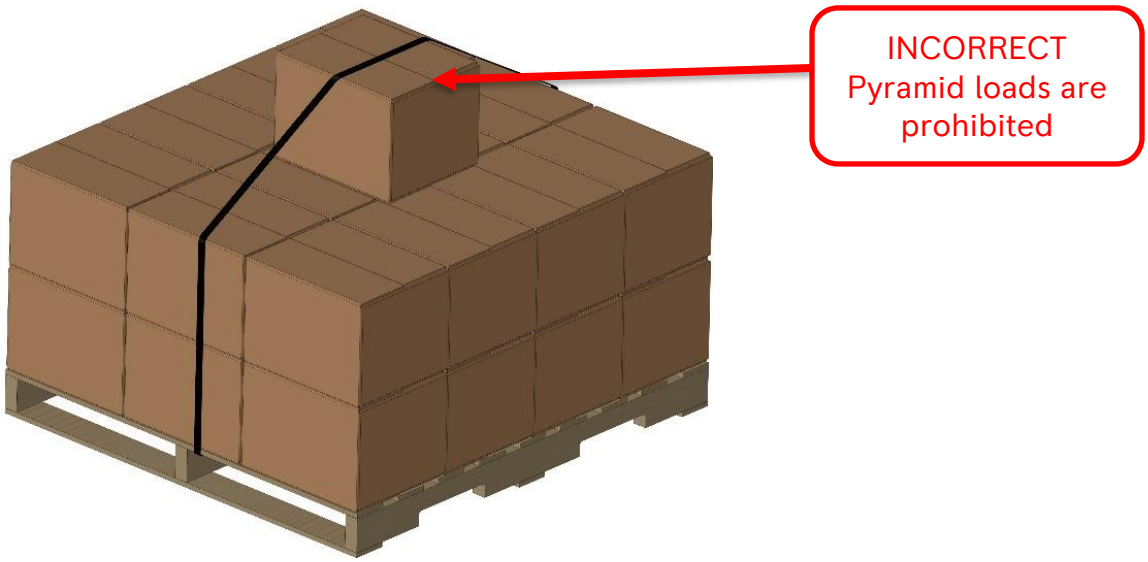
CORRECT
Banding must give access to forklift



CORRECT
Sufficient banging must be used to stabilize the unit load

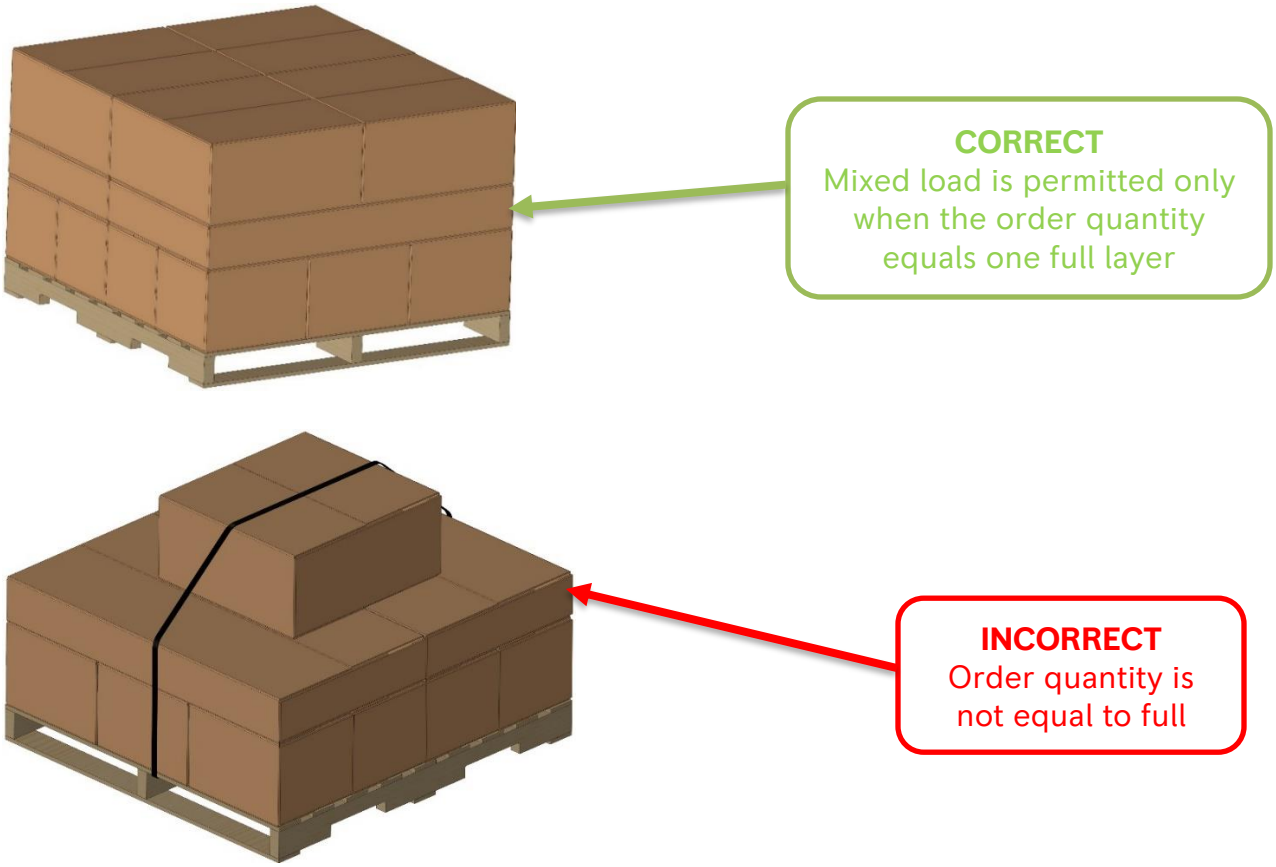
4.5.3 Pyramid load

- When stacking cartons on pallets, attempt to use full surface area of the pallet. Pyramid stacks are prohibited



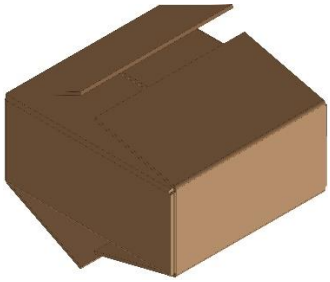
4.5.4 Mixed Load

- All palletized loads should only contain one-part number per load. However, mixed pallet loads are acceptable. All mixed load pallets must be clearly marked on all four sides with signage in large print, “Mixed Load”. Unless the load is marked “Mixed Load”, a mixed load is acceptable ONLY when:
  - The order quantity equals one full layer.
  - All containers on the pallet are individually identified with a bar code label along with a “Mixed Load” label in bold 1.0” (25.4mm) letters attached in a noticeable location.
  - Individual part numbers are sorted on the pallet with all labels easily readable on the pallet without need to break down pallet.
  - Packing list is broken down on a pallet level basis for part quantity checking purposes.
  - Refer to section 7.3 for more information on Mixed Label Loads.

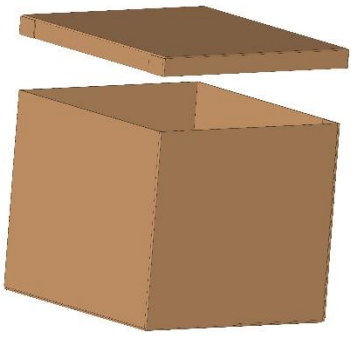


4.5.5 Carton

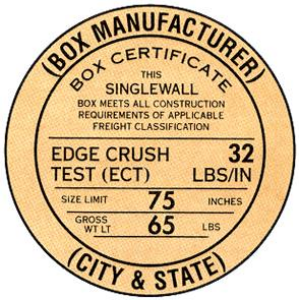
- When determining carton size, it is ***mandatory*** that standard size manually handled containers are to be modular to the shipping pallet. Any deviations from this method will result in a return shipment.
- Corrugated material used in shipping containers must have adequate strength to withstand the test of usage; the parts and container must arrive in satisfactory condition until presented at point of use.
- Manually handled containers that are both palletized and unpalletized (unless the weight of individual part is over 35 pounds) must not exceed 35 pounds total weight (weight of the part + package).
- All cartons being received shall be labeled according to the North America Container Label Specification. For guidelines on labels, please refer to section 7.0.
- Box manufacturers stamp must be printed on the box.
- A minimum of 44-pound edge crush (ECT) or 275 pound burst test is required unless approved by RRSA.
- Refer 6.5 for packaging closure requirements



Regular Slotted Box (RSC)



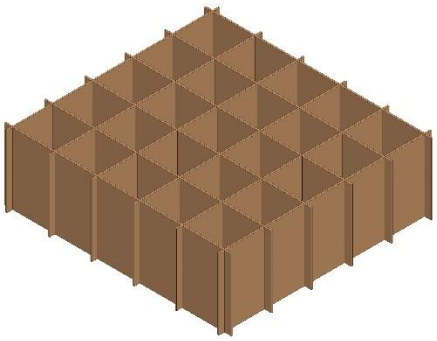
Half Slotted Box (HSC)

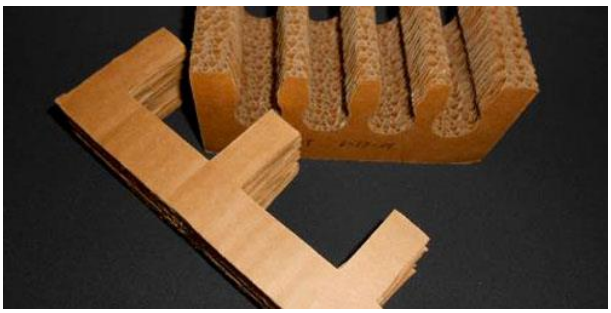


ECT Stamp

4.5.6 Dunnage

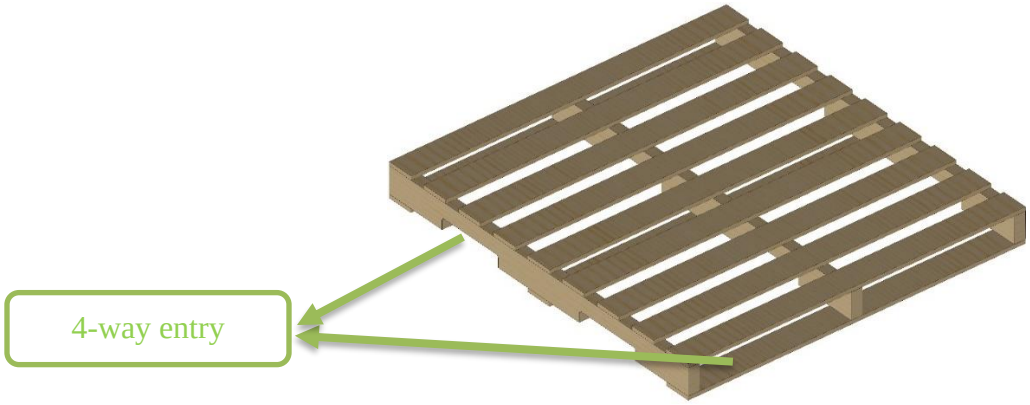
- Suppliers are responsible for the design, performance and procurement of all expendable dunnage. The dunnage should be designed to minimal levels, which includes minimal set up, maximizing density, loading and unloading labor and allow for ease of recycling and/or disposal that achieve protection and preservation of the part.
- Supplier must use proper dunnage to protect the part characteristics, for example if the part is a painted supplier must use class A materials like Nomar to protect the part from abrasions.
- Supplier should consider using corrugated first unless foam is the only material to protect the part finish.
- If part exceeds the carton strength, sufficient dunnage must be used, For example wooden corner posts etc. to increase the strength of the carton.

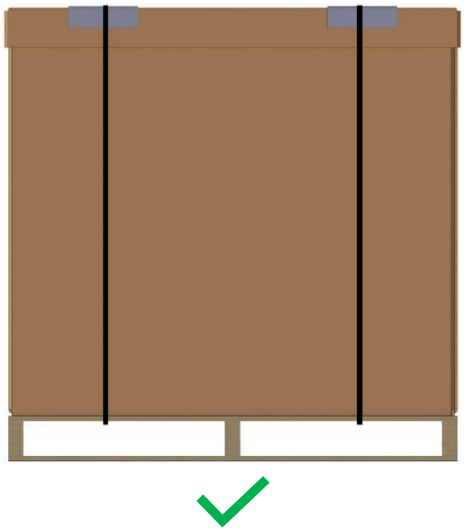


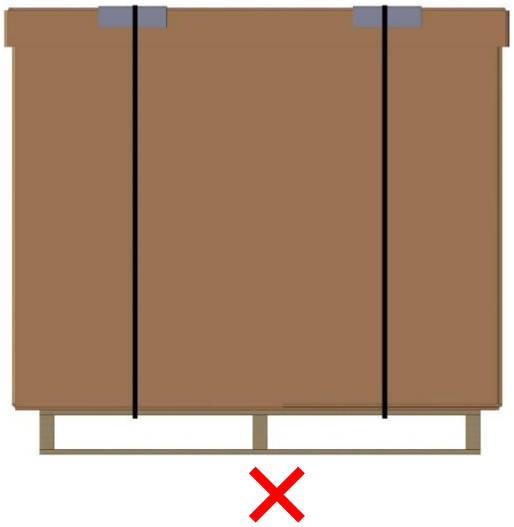


4.5.7 Wood Pallets

- All wooden pallets shipped into Rolls-Royce America Inc. must be double face wood construction and provide **four-way entry**.
- Pallets must not be smaller in length and width than the load height.
- Cartons must not **overhang** the pallet.
- Pallet shall support load of material with a minimum of 2,500 pounds to the maximum of 4,000 pounds.
- Broken or cracked pallets are not acceptable.
- Top surfaces of pallets should be flat to permit stacking.







4.6 Corrugated Pallet Boxes

All corrugated pallet boxes **must** be sufficient strength to withstand triple stacking to a height of 110" (2794 mm) under full load. If attached to a wooden pallet, they ***must*** also be a breakaway design with minimal staple usage to allow easy disassembly.

4.7 Packaging Approval Process

All production part packaging must be approved prior to delivery to the factory. All production part packaging shall require submittal of: Packaging Data Sheet (PDS).

- Refer 2.0 Scope for location specific email addresses.
- **Packaging Data Sheet** which can be obtained from the Packaging Department.
- Sample pack shipped to RRSA.

Additionally, the following may be required prior to implementation:

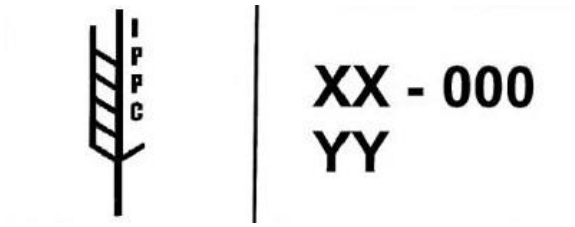
- Photographs and drawings of proposed packaging – pallet load, primary pack and internal dunnage
- Package testing

The **Packaging Data Sheet** may also be used to submit proposed packaging changes to Rolls-Royce America packaging department. A copy of this sheet can be obtained by contacting the purchasing or packaging department.

4.8 Regulations on Wood Packaging

Many countries have implemented strict guidelines for wood when it passes across their borders. This is to prevent harmful insects which live in wood from spreading through wooden packaging. It is the supplier's responsibility to ensure all shipments meet the importing country's import regulations. **Heat treat certification must be available upon request**.

When using packaging outside the EU borders, RRSA standard wooden packaging must conform to the ISPM-15 (International Standards for Phytosanitary Measures number 15) requirements. This means that packaging **must** undergo heat treatment (HT) and kiln drying or Methyl Bromide (MB) fumigation and also be stamped with IPPC symbol. The following is an example of the IPPC symbol.



Wood treated via MB will need to be accompanied with additional paperwork prior to unload at RRSA facility. Any loads without the accompanied paperwork will be refused.

4.9 Hazardous Material

The packaging of hazardous materials shall follow relevant US and Canadian transportation regulation which prescribe the proper method of classification, packaging, marking and labeling of each shipment. Furthermore, where other federal, state, or local standards and/or regulations are in effect, the packaging and labeling shall comply.

5.0 Part Cleanliness, Preservation and Protection

5.1 Part Cleanliness

Parts must arrive at RRSA clean and corrosion free in a ready for use state, which will not require washing. Cleanliness of the parts must not be degraded by any of the packaging material used to pack and ship.

5.2 Corrosion Protection for Metallic Components

Metallic parts from suppliers are to be packaged and preserved in compliance with the specification MTV 5066 “Corrosion Protection for Metallic Components”. The MTV 5066 replaces the previous specification on corrosion, the CD-TFL-005 and the CD-TFL-006. You can find the MTV 5066 under the following address: Supplier Downloads (mtu-solutions.com)

It is our intention to allow our suppliers to use their standard rust proofing materials where possible; however, the responsibility remains the suppliers to provide preservation until the point of use.
If using a hazardous material for preservation, approval from the RRSA packaging department is required.

If parts are being shipped pre-painted, then the rust proofing is still necessary on unpainted surfaces. It is essential that parts are protected from airborne dirt after they have been rust proofed.

5.3 Surface Protection

Painted and/or machined surfaces must be protected against rust, abrasions, nicks, scratches, dents, etc. Surface protection should be provided to any part which requires the need by using an approved protective material.

When part shifting or rubbing will cause damage and/or entanglement of the part or package, separation is required. All fragile parts should be cushioned properly for protection from shock and vibration damage.

- Parts should be adequately protected for handling up to point of use.
- Design package so parts may be removed without special maneuvering.
- Construct packaging so it does not fall away from the part when the closure is removed.

5.4 Electronics and Electrostatic Discharge Packaging (ESD)

Many electrical components, including computer chips, electronic assemblies and circuit boards, can be **damaged beyond repair by electrical discharges** and must be packaged using Electrostatic Discharge Packaging (ESD).

Assemblies that include electro sensitive material (for example printed circuit assemblies) shall be protected by placing them within moisture barrier bags which provide protection from electrostatic discharge (ESD) and sealing them with an ESD label. Please add additional protective packaging material were necessary.

Electro sensitive components (for example, integrated circuits) shall be packaged by implanting them in static dissipative foam which is enclosed in a moisture barrier bag which provides protection from ESD and sealing it with an ESD label. Electro sensitive components must be packaged individually in separate bags.

For example: Packaging of a plug-in circuit board. First step is to pack the part and the label into an ESD-bag and apply a label to the outside. Second step is to put the bag – with the part – into a box which is covered inside with foamed material.

5.5 Package Closure Requirements

- The packaging closure must maintain interior cleanliness and ensure that the contents remain intact during shipping and handling.
- Package closure and construction shall permit access to the contents for inspection without destroying the usefulness of the container.
- Packaging closure must be easily removable without using tools, to avoid a waste of time and labor.
- Preferred material for closure of a carton is reinforced (non-asphaltic) gummed tape or pressure sensitive tape, minimum width: two inches. **Kraft**
- Package closure shall not cause damage to parts within the container.
- Package closures must be capable of containing the part within the bag/carton/container during shipping and handling.

5.6 Shelf Life

Special packaging requirements to shelf-life sensitive materials like paper, plastics and other sensitive materials can be obtained from the specification MTV5005 (you can find this specification online under the following link: Supplier Downloads (mtu-solutions.com)).

6.0 Labeling Requirements

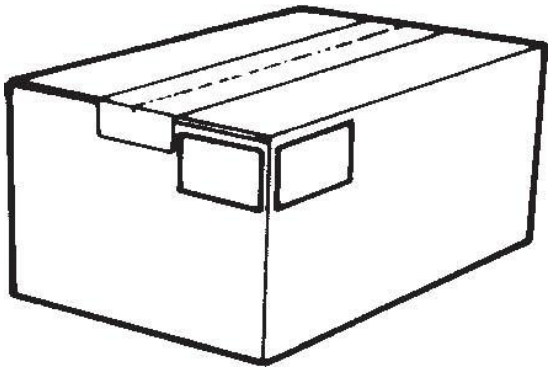
Rolls-Royce America will require suppliers to bar code label all material supplied to all Rolls-Royce America facilities. All shipments are required to be easily and quickly

identified (HANDWRITTEN INFORMATION IS NOT ACCEPTABLE). All shipments must be identified per North America Container Label Specification. A copy of this specification can be obtained by contacting the purchasing or packaging department.

6.1 Label Location

Each carton must be labeled individually. Labels should be located on two adjacent sides of the container in most cases. Illustrations of the most common shipping packs and recommended label locations are shown in the North America Container Label Specification.

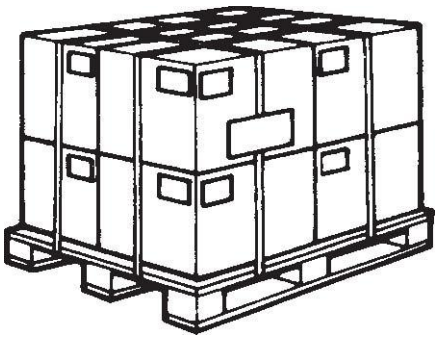
When possible, the top edge of the label should be parallel to the top of the package/container. To facilitate automatic readings of bar code symbols, the top edge of the label should not be more than 20 inches from the bottom of the container.



6.2 Master Label

A “Master Label” must be used when multiple packs of the same part numbers are shipped.

Each pallet load of small containers will use two Master labels, one each placed on opposite sides of the pallet load. See North America Container Label Specification for a Master Label example.



6.3 Mixed Load Label

Any pallets containing multiple part numbers require four Mixed Load labels, one on each side of the pallet load. This label replaces the Master Label for mixed loads. See North America Container Label Specification for a Mixed Load label example.

6.4 Label Protection

Label protection against moisture, weathering, abrasion, etc., may be required in harsh environments and is encouraged whenever practical. Laminates, sprays, window envelopes, and clear plastic pouches are examples of possible protection methods. In choosing any protection method, care must be taken to assure that labels meet reflectivity and contrast requirements and can be scanned with contact and non-contact devices. Suppliers should be aware that environmental conditions may affect the label and its print quality/readability (i.e., extreme temperatures, sunlight, etc.) all of these conditions may conversely affect the readability of the bar code label.

6.5 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. Supplier and customers will work together for any special circumstances not covered in these standards. (i.e., multiple, common item packs, mixed item loads, returnable material labeling, line delivery locations)

6.6 Packing Lists

- All parts on the packaging list must reference RRSA part numbers.
- Packing list is broken down on a pallet level basis for part quantity checking purposes.
- Suppliers must provide a contact on the packing list to ensure any issues are addressed and resolved promptly.
- **Mandatory header level information:**
  PO number
  Date of issue
  RRSA receiving location name and address
  Supplier´s shipping location name and address
  Gross weight
  Net weight
- **Mandatory item level information:**
  RRSA purchase order and line-item number
  RRSA part number
  Supplier´s material number and material description
- **Mandatory lot level information:**
  Lot quantity and unit
  Number of shipping units (palettes, big bags etc.)
  Supplier´s lot number
  Date of production of each lot
  Lot weight

6.7 Country of Origin Labeling Requirements

Country of origin (often abbreviated to **COO**), is the country of manufacture, production, or growth where an article or product comes from. Unless excepted by law, section 304, Tariff Act of 1930, as amended (19 U.S.C. 1304), requires that every article of foreign origin (or its container) imported into the United States shall be **marked** in a conspicuous place as legibly, indelibly, and permanently as the nature of the article (or container) will permit, in such manner as to indicate to an ultimate purchaser in the United States the English name of the country of origin of the article, at the time of importation into the Customs territory of the United States. Containers of articles accepted from marking shall be marked with the name of the country of origin of the article unless the container is also accepted from marking.

Refer to section 3.0 for transportation routing instructions.

6.8 Reman Identification Requirements

The packaging for remanufactured parts must be identified as such in accordance with Federal Register/Vol 67, No 43, Part 20 – Guides for the Rebuilt, Reconditioned and Other Used Automobile Parts Industry.

7.0 Returnable Packaging

Returnable containers are intended to be used repeatedly and frequently. Their success as cost effective packaging depends on how well they are cared for, controlled and returned to be reused.

A variety of factors deserve consideration in the decision to use returnables, such as:

a. Initial cost
b. Facility/equipment constraints
c. Repair costs
d. Transportation costs
e. Standardization
f. Return ratio
g. Geographic relationships (location of supplier)
h. Volume
i. Handling costs
j. Cleaning
k. Environmental concerns
l. Product protection
m. Tracking costs
n. Administrative costs
o. Visual inventory management
p. Ergonomic issues

Due to these factors, returnable containers are not always the most cost-effective choice for packaging.

RRSA owned returnable containers are provided for exclusive use of RRSA parts in transit, in RRSA facility, and JIT production needs. Only goods ready for delivery may be packed in RRSA returnable containers. They ***are not*** to be used for storage ***or*** work in process. Loop calculations are based on the above mentioned and any obstructions will present a container shortage that ***will not*** be accommodated.

All suppliers utilizing returnable containers must provide RRSA with a proposed expendable packaging plan via the
Packaging Data Sheet. A copy of this sheet can be obtained by contacting the purchasing or packaging department. This expendable package will be the only non-returnable packaged utilized for said part in the event of container shortages. Each shortage situation requires approval and any container, rack, and dunnage shortages ***must*** be brought to the attention of your RRSA representative prior to shipping in the alternate packaging. Failure to follow this process may result in unpaid expenses consequential of the shortage.

All small lot returnable containers (those handled manually) must not exceed 35 lbs. including parts and container.

For specifications on part cleanliness and preservation, please refer to section 6.0.

7.1 Container Identification

All returnable containers, racks, trays, totes, etc. must have clear identification of their container number in 1-1/2" letters embossed into the container, painted onto the container, or affixed to the container with permanent labeling. In addition, supplier owned returnables must have the supplier's name clearly marked on the container as "Property of *Supplier*."

All returnable containers, racks, trays, totes, etc. must also have clear labeling of the supplier name and return to location affixed to the container with permanent labeling.

Suppliers ***must*** ensure that all materials shipped to RRSA are correctly labeled and that the labels are properly attached or inserted into the holder/placards on the racks or containers.

7.2 Container Management

Suppliers utilizing RRSA owned containers must sign a **Returnable Container Packaging Agreement** (document # CD-TFL-003) which defines supplier and RRSA responsibilities utilizing returnable containers. A copy of this form can be obtained by contacting the purchasing or packaging department.

7.2.1 Container Maintenance

Maintenance cost procedures for returnable systems will be handled on an individual supplier/customer basis. RRSA will be responsible for the maintenance and replacement costs of RRSA owned containers and purchases of new containers for volume increases.

The supplier is responsible to maintain cleanliness of the containers used. This includes ensuring the containers are free of debris that would impact the quality of the material

being packaged prior to loading with RRSA parts. It also includes assuring that the removal of old labels prior to shipping has been completed.

It is the supplier's responsibility to inspect all racks and containers prior to loading to ensure that damaged equipment **which could cause damage to parts or injury to handlers/operators** is segregated and removed from the system for subsequent repair or scrap disposition by RRSA. As damaged equipment is so segregated, it should be collapsed, folded down (where applicable) and clearly marked "Damaged Container Do Not Re-Use". At this point, suppliers should call their RRSA representative who will advise what transportation arrangements to make. See photo below for example of tag.

7.3 Standard Containers

RRPS requires the use of standard containers and standard footprints whenever possible. The acceptable standard footprints for RRPS are 32" x 30" and 48" x 45". Use of any other pallet load or container footprint size is by exception and must receive authorization by Rolls-Royce Solutions America packaging prior to implementation.

Below is a list of standard small totes, pallets/lids, and bulk bin containers:

Large Bulk Containers

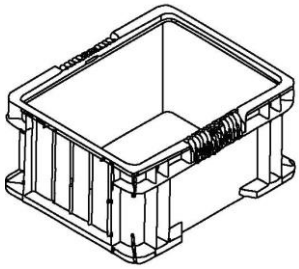
Container ID	Description	Dimensions	Color
V06	HDPE (UV Stabilized) injection molded structural foam collapsible container with two access doors.	32" x 30" x 34"	Yellow base and black wall
V07	Same as above	32" x 30" x 25"	Yellow base and black wall

V21	Same as above	48” x 45” x 34”	Yellow base and black wall

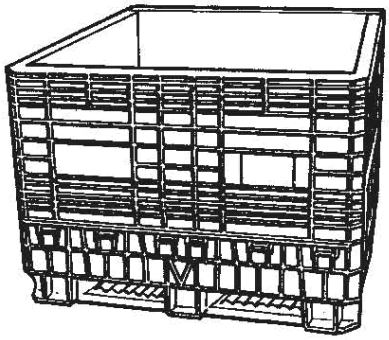
RRPS packaging utilizes the above containers whenever functionally and financially feasible for a supplier or part. Other containers may be chosen for better fit, part protection, cost effectiveness or other reasons.

Suppliers who own their own containers may implement those containers with prior approval from RRPS.

Examples of common returnable containers:



Small Plastic Tote



Large Plastic Knockdown Container (V21 example)

7.4 Internal Dunnage for Returnable Systems

Returnable dunnage:

Common returnable dunnage materials:

- Plastic corrugated board
    - Layer Pads – parts requiring separation between stacked layers
    - Partitions – parts requiring separation between parts
- Thermo-formed trays – heavy and odd shaped parts; parts requiring specific line side orientation/presentation to the operator
- Structural foam trays – robotically or automatically unloaded parts
- Die cut foam inserts – small parts requiring orientation and protections

Whenever possible:

- Recyclable materials should be used and clearly marked as to resin type established by the Society of Plastics Industry (SPI).

Expendable dunnage:

Common expendable dunnage materials:
- Corrugated paper board
- Layer pads – parts requiring separation between stacked layers
- Partitions – parts requiring separation between parts
- Plastic corrugated board – used as corrugated (as above), but for overseas shipments
- Wood boards – as dividers, corner posts, separators
- Foam blocks – for large odd shaped parts requiring additional protection and proper part orientation/presentation to the line side operator

Whenever possible:
- Paper based dunnage should be used
- Recycled content materials should be used

Plastic expendable dunnage must be recyclable and clearly marked as to resin type established by the Society of Plastics Industry.

When using wood or corrugated, no foreign materials (i.e. foam) should be adhered to the wood or corrugated material – No Mixed Dunnage.

8.0 After Sales Specific Information

8.1 Bulk Packaging Design

All part quotations and shipments for After Sales are to assume expendable packaging, following the general packaging requirements set forth in this document. Suppliers are responsible for designing their own expendable packaging, including expendable dunnage used inside a returnable container. RRSA Packaging Department will assist in developing acceptable shipping containers on request or in certain circumstances. Approval of the proposed pack must be made prior to the first shipment. **Supplier is responsible for packaging performance. Test ship if necessary.** Deviations from the approved expendable packaging for shipping After Sales parts would require approval from After Sales packaging department (packaging.brownstown@ps.rolls-royce.com). **Packaging Data Sheet** can be used to communicate changes.

Returnable packaging for After Sales shipments must be approved in advance by both production packaging department (packaging@ps.rolls-royce.com) and After Sales packaging department (packaging.brownstown@ps.rolls-royce.com)

8.2 Ready For Sale Packaging

Applies to parts on contract to be supplied in Ready for Sale packaging. Ready for Sale packaging is the packaging that will be displayed on the customer shelf for sale. This packaging and labeling consists of the unit pack quantity packaged in Detroit Diesel/MTU or affiliated brand packaging.
All ready for sale packaging and graphics requires a sample be submitted for approval before manufacturing. Contact the After Sales packaging department (packaging.brownstown@ps.rolls-royce.com) for details. All pertinent information (i.e. size, style, grade, etc.) must accompany the sample. The submitting of samples does not bind Rolls-Royce Solutions America Inc., in any way to order from a particular supplier.
Ready for sale packaging must contain and be labeled as the unit pack quantity.

9.0 Process Changes

Process changes of the above specifications are of major concern to RRSA. Therefore, please notify the RRSA Product Buyer or Supplier Quality Engineer, should you decide to change a process.

10.0 Appendix

10.1 Glossary of Terms

Bottom Deck - Load bearing surface

Bursting Strength – A measurement of the ability of a material to resist rupture when pressure is applied to one of its sides.

Compression Strength - The maximum load that can be applied to a container under specified conditions. Static compression refers to a containers ability to withstand a stationary load for a period of time. Dynamic compression strength refers to the load at failure when and increasing load is rapidly applied.

Certificate, Box Maker's – A statement printed on a corrugated fiberboard box guaranteeing that all applicable construction requirements of the carriers have been observed and identifying and locating the box maker.

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

Corrugated Board (Double Wall) – A corrugated board construction composed of three linerboards and two fluted mediums. The board is stiffer and stronger than single wall and is used for containing heavier products.

Corrugated Board (Single Wall) – A corrugated board construction composed of two linerboards and one fluted medium. The board is not as strong as double wall or triple wall.

Corrugated Board (Triple Wall) – A corrugated board construction composed of four linerboards and three fluted mediums. The board is stiffer and stronger than single wall and double wall and is used for containing industrial sized heavy products.

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

Density – the weight of a given volume of a material. In inch/pound units this is usually expressed in pounds per cubic foot.

Dunnage – Devices or Materials use to support, hold, secure, and/or protect goods during shipment.

Footprint – The projected area upon a horizontal plane describing the outermost dimensions of length and width of a pallet, container or container system.

Level One Container – The first wrap or containment of a product. (Also known as primary package or child container)

Level Two Container – A package or containment of primary package. (Also known as secondary package or parent container)

Notched Stringer – The structural component of a pallet to which the deck boards are attached.

Overhang – A condition in which the edges of packages or products go beyond the perimeter of a pallet, losing support for the package or product and making them more vulnerable to abrasion and damage.

Overpack – Shipping container the Bulk or Ready for Sale parts go into for protection during shipping.

Pallet – A portable platform on which groups of packages are unitized into a single load to facilitate efficient distribution.

Primary Container/Carton – The lowest level of packaging associated with a bulk part.

Rust/Corrosion - Oxidation that is readily discernible with the naked eye under normal lighting

Standard Pack/Standard Pack Quantity – The standard pack is the smallest full container with a constant quantity and size. The standard pack quantity is the consistent number of pieces in the standard pack.

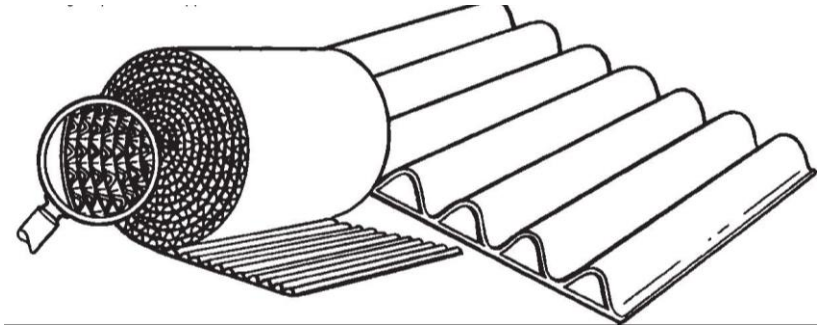
Tare Weight - The weight of containers, excluding the weight of the parts.

Unit Pack – The lowest level of packaging associated with a Ready for Sale part and specified by RRSA Product identification is either applied with a label or printed directly onto a package.

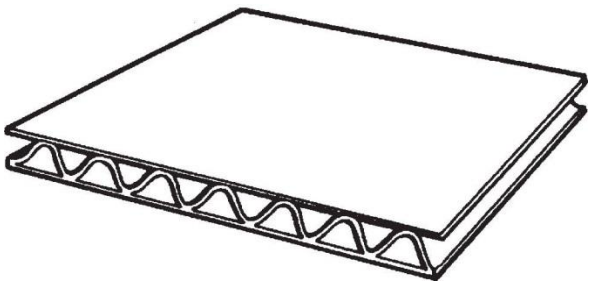
Unit Pack Quantity – The number of pieces of the part to be packaged in the unit pack specified by RRSA. This quantity is to be preprinted or imprinted on the unit pack container or material label.

10.2 Corrugated Board Material

Single Face
Consists of one layer of corrugated medium bonded to single layer of linerboard. Provides cushioning for products wrapped in it.

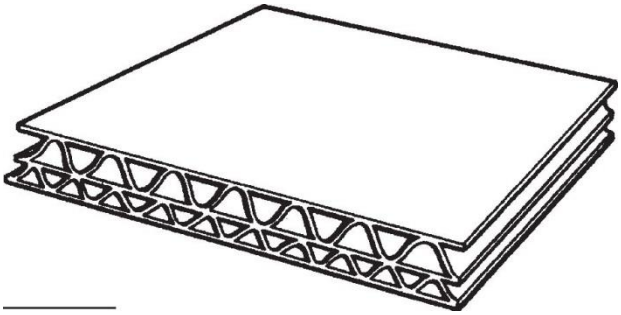


Single Wall
Has a second facing glued to the other side of the fluted medium resulting in a rigid structure.



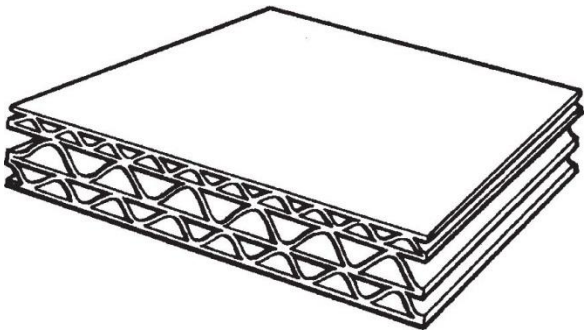
Double Wall

Adds another fluted medium and another sheet of linerboard for greater strength. It has three facings with two fluted corrugated medium sheets between them. Has a high stacking strength and is a good application for heavy products.



Triple Wall

Consists of four facings with three fluted corrugated medium sheets between them. Offers exceptional strength for packaging very large or heavy products.



If you have any further questions please feel free to contact the Rolls-Royce America packaging department (packaging@ps.rolls-royce.com).

Thank You!