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Inputs & Outputs

Inputs	Process	Outputs
Airmar PO/specifications; part drawings; known critical surfaces; shipment mode; part fragility/weight	Supplier designs packaging to protect parts through handling, storage, transportation, and receipt at Airmar.	Clean, conforming, damage-free parts received by Airmar.
		Stable unit load with parts immobilized and isolated.
		Reduced dents, dings, scratches, cracked parts, and container damage.

1. PURPOSE & SCOPE

This document communicates Airmar Technology Corp.'s minimum expectations for supplier packaging. The goal is to ensure parts arrive clean, complete, and damage-free after normal supplier handling, warehousing, transportation, cross-dock activity, and Airmar receiving.

The requirements apply to all suppliers shipping to Airmar, including domestic and international suppliers. The manual is intended to be practical and easy to apply; it does not replace engineering drawings, purchase order requirements, contractual quality requirements, or specific written packaging approvals.

COMMON GOAL FOR ALL PACKAGING

- Parts shall be isolated from each other on all sides, including top and bottom.
- Parts shall not move under, over, or around dividers during normal vibration and handling.
- Packaging shall prevent part-to-part contact that could cause dents, dings, scratches, rub marks, chips, cracks, contamination, or deformation.
- Parts shall be blocked, braced, cushioned, nested, bagged, sleeved, or otherwise retained so they do not move enough to damage themselves, nearby parts, inner packaging, or outer packaging.
- Packaging shall be suitable for the selected shipping mode, shipping distance, handling environment, and part sensitivity.



Overall packaging goal example

2. REQUIREMENTS FOR PROCESS

Supplier Responsibility

The supplier is responsible for selecting, validating, using, and maintaining packaging that protects parts through handling, storage, transportation, and receipt at Airmar. Approval or feedback from Airmar does not remove the supplier's responsibility to deliver conforming parts in damage-free condition.

Packaging Design Considerations

- Account for part weight, fragility, surface finish, critical features, center of gravity, and susceptibility to moisture, corrosion, or ESD.
- Account for the shipment mode, such as parcel, LTL, truckload, air, or ocean. Longer and international shipments generally require more robust moisture, corrosion, and edge protection.
- Choose cartons, totes, crates, pallets, trays, dividers, cushioning, and closures that maintain part protection.
- Use consistent packaging quantities and packaging layouts for repeat shipments unless otherwise agreed.

Packaging Changes

Suppliers shall notify Airmar before changing any packaging feature that may affect part quality, planning, storage, or receiving. Examples include container size, packaging quantity, dunnage, divider layout, pallet pattern, returnable packaging, and corrosion protection.

3. DEFINITIONS

Term	Definition
Critical Surface	A cosmetic, machined, coated, sealing, electrical, optical, ceramic, or functional surface where damage could affect form, fit, function, appearance, or reliability.
Dunnage	Internal packaging materials, such as dividers, foam, corrugated inserts, trays, bags, sleeves, pads, interleaves, caps, plugs, and blocking or bracing.
Part Segregation	A packaging method that keeps each part separated from other parts and from hard container surfaces on all sides, including top and bottom.
Unit Load	A palletized or otherwise secured shipment unit handled as one load.
ESD	Electrostatic discharge. Use appropriate ESD-safe packaging where electronic components or printed circuit boards may be damaged by static electricity.

4. PROCEDURE

General Packaging Requirements

- Use clean, dry packaging free from loose debris, oils, chips, insects, odors, and contamination.
- Select outer containers strong enough to withstand part weight, pallet stacking, and transportation handling.
- Do not use damaged cartons, broken totes, cracked trays, protruding nails, loose pallet boards, or worn dividers.
- Fill voids or redesign the packaging so parts cannot shift or damage the container.
- Keep manually handled cartons at a safe weight. As a guideline, target 35 lb / 16 kg or less where practical unless otherwise agreed.



Approved outer carton / tote example

Internal Part Segregation

- Use individual cells, molded trays, corrugated partitions, pressed board sleeves, interleaves, or other methods appropriate for the part.
 - Painted or anodized parts may be wrapped in foam, plastic bags, or paper but still require partitions.
- Divider height and fit shall prevent parts from climbing over, sliding under, or wedging around dividers.
- Use bottom pads, trays, or separators under the first layer and top pads, lids, or separators over the last layer.
- When multiple layers are used, include a separator between each layer that prevents load transfer and rubbing.
- Parts shall not contact staples, pallet nails, sharp edges, banding, rough wood, or abrasive materials.



Approved internal divider example



Rejected divider example

Surface and Feature Protection

- Protect coated, painted, anodized, plated, polished, machined, and sealing surfaces from abrasion, pressure marks, and hard contact.
- Protect delicate edges, corners, tabs, pins, connectors, threads, ceramic features, and plastic clips from impact, compression, and bending.
- Do not apply tape or labels directly to critical or cosmetic surfaces unless specifically approved by Airmar.
- Use caps, plugs, sleeves, or covers where openings, threads, sealing surfaces, or connectors require protection.

Moisture, Corrosion, Contamination, and ESD Control

- Use bags, liners, vapor corrosion inhibitor materials, desiccant, rust preventive methods, or sealed packaging when parts are susceptible to moisture or corrosion.
- Package parts so loose fibers, dust, foam particles, or corrugated debris cannot contaminate parts.
- Use ESD-safe packaging for printed circuit boards, electronic assemblies, and static-sensitive parts.
- Wet, moldy, oil-soaked, or contaminated packaging is not acceptable.

Exterior Packaging, Pallets, and Unitization

- Cartons shall be properly closed and shall not arrive torn, open, crushed, wet, or excessively bulged.
- Unit loads shall be stable and secured to the pallet using stretch wrap, banding, corner boards, top caps, or equivalent methods.
- Unit loads shall not overhang pallets unless approved. Distribute heavy items evenly and low in the load.
- Pallets shall be clean, dry, sound, and free of broken boards, protruding nails, loose blocks, and excessive splinters.
- International wood packaging shall comply with applicable ISPM 15 requirements.



Approved palletized shipment example

Returnable Packaging

- Returnable totes, trays, pallets, and dunnage may be used when agreed with Airmar.
- Returnable packaging will be clean and maintained in good condition.
- Do not ship returnables with missing dividers, broken latches, cracked trays, sharp edges, or contamination.
- Returnable packaging shall only be used for the intended part number and packaging quantity unless otherwise approved.

Special Component Requirements

Component / Part Type	Typical Damage Risks	Minimum Packaging Expectations
Coated parts: painted, anodized, plated, powder coated	Scratches, rub marks, chips, adhesive residue, dents	Individual wrapping or cells; no hard contact; protective sheets between layers; no tape on finish; immobilize parts.
Metal housings	Dents, dings, machined surface damage, edge impact	Rigid cells or foam/corrugated blocking; protect machined/sealing surfaces; prevent part-to-part contact.
Metal parts	Rust and corrosion	Avoid using oils to coat metal. Best to use VCI paper wrapped around metal component.
Fairings	Surface scratches, deformation, edge damage	Large surface support; shaped dunnage where needed; avoid point loads; protect edges and finish.
Ceramics	Cracking, chipping, fracture from shock	Individual cushioning; no direct contact; double-boxing or engineered foam for parcel shipments; immobilize on all sides.
Sheet metal components	Bent corners/flanges, scratches, nested part abrasion	Interleaves, edge protectors, orientation control; prevent sliding, nesting pressure, and corner damage.
Plastic components	Scratches, cracks, warping, stress whitening, broken tabs	Soft separators; avoid excessive compression/heat; protect clips, tabs, and snap features; do not load heavy items on unsupported features.
Printed circuit boards / electronic assemblies	ESD damage, connector damage, component damage, contamination, flexing	Use ESD-safe bags/trays/containers; support boards to prevent flex; protect connectors and components; keep clean and dry; do not stack boards without separators.



Component-specific approved examples

Packaging Review and Damage Response

- Airmar may request photos or samples for new parts, revised packaging, fragile parts, or parts with prior damage history.
- Recommended photo set: empty container, bottom protection, loaded first layer, divider detail, all loaded layers, top protection, closed carton, and palletized load.
- If damage occurs, the supplier is expected to contain shipments, determine the root cause, improve packaging, and prevent recurrence.
- Suppliers shall continuously improve packaging to reduce waste and cost while maintaining or improving part protection.

SUPPLIER PACKAGING CHECKLIST

Check	Requirement
☐	Parts isolated from each other on all sides, including top and bottom.
☐	Parts cannot migrate under, over, or around dividers.
☐	Critical, cosmetic, coated, machined, ceramic, electronic, and sealing surfaces are protected.
☐	Parts are immobilized so movement cannot damage parts or packaging.
☐	Carton strength, cushioning, blocking, and bracing match the shipment mode and part fragility.
☐	Top and bottom layers are protected, and separators are used between layers.
☐	Moisture, corrosion, contamination, and ESD controls are applied where needed.
☐	Unit loads are stable, secured, and not overhanging unless approved.
☐	International wood packaging complies with ISPM 15 where applicable.
☐	Packaging changes are communicated to Airmar before implementation.
☐	Packaging photos or samples are available when requested.

PHOTO APPENDIX



Approved bottom and top protection



Approved individual cell / divider retention



Approved ESD packaging for printed circuit boards



Rejected packaging: parts touching or rubbing



Rejected packaging: parts migrating under or around dividers



Rejected packaging: crushed, bulging, wet, or open outer carton

PROCESS COMPLETE