SUPPLIERS PARTNERSHIP FOR THE ENVIRONMENT

Automotive Packaging Materials Collection & Handling Practices

SP Guidance Document, v1.0

July 2025

Introduction & Project Overview

Companies in the automotive supply chain may lack information on standardized procedures for recycling packaging waste, which can lead to inconsistent and inefficient material handling and lost opportunities for material recovery.

This project aims to:

- Identify practical, implementable practices based on SP member experiences.
- Recommend voluntary guidelines for sorting, storing, transporting, and recovering materials.
- Support OEMs, suppliers, and packaging stakeholders in achieving sustainability and waste reduction goals.

Project Scope: Automotive Packaging Materials Covered

- Corrugated Cardboard & Paper-Based Packaging
- Plastic Films & Polybags (LDPE, HDPE, VCI Bags)
- Wood Packaging (Pallets, Crates, Dunnage)
- Plastic Dunnage & Rigid Containers
- Scrap Metal, Metal Banding, Fasteners & Wire Harnesses
- Foam Packaging (EPS, EPE, PU, EPP, XLPE)
- Universal, Hazardous & Special Packaging Waste (airbags, oily rags, batteries, lamps)

Key Project Goals & Deliverables

Goals:

- Maximize recyclable material recovery.
- Increase implementation of leading practices across automotive facilities.
- Identify opportunities to reduce the volume of material sent to landfill and decrease contamination of recycling streams.

Deliverables:

- SP Guidance Document on Automotive Packaging Materials Collection & Handling
- Material-specific handling & sorting information
- SOP templates and implementation tools for facilities

Acknowledgements: This guidance document was produced through a collaborative process by members of the Suppliers Partnership for the Environment (SP) Sustainable Packaging Work Group. Sincere thanks to Gina McGee of RecycleMax for her leadership and contributions in spearheading the development of this document.

Contact: Please submit any feedback on this guidance or suggestions for future improvements to info@supplierspartnership.org.

Material-Specific Handling & Collection Guidance

Handling recommendations are broken out by material type and facility volume. Recommendations reflect what are likely to be more effective and scalable methods for average automotive manufacturing, assembly and distribution sites based on industry experience, with color-coded container guidance and staging logistics. Please note additional recommendations can vary based on business, operational, and other needs at an individual site.

Plastics – Identifying Waste Volume & Collection Needs

Note: For certain materials like polyethylene, baling and densification serve different operational and financial purposes. **Baling** is generally more suitable for clean, thin-gauge flexible packaging and is favored by recyclers due to its uniformity and stackability. **Densification**, on the other hand, is used for bulky foams like EPE to reduce volume dramatically, enabling more cost-effective shipment. However, densified foam often has **lower recycling market value** than clean, baled film and may limit downstream applications. Choose the method based on available infrastructure, volume, and end-market requirements.

Material	Volume Tier	Handling Suggestions
HDPE Polybags	Low (<500 lbs/wk)	Collect in color-coded brutes or gaylords labeled "HDPE Only." Store indoors.
	Medium (500–2,000 lbs/wk)	Collect in same containers. Stage dockside or bale if possible.
	High (>2,000 lbs/wk)	Bale onsite. Stage trailer for recurring pickup. Separate dirty vs. clean.
LDPE/LLDPE, Clean VCI, Bubble Wrap, Stretch Film	Low (<500 lbs/wk)	Same as HDPE; emphasize contamination-free sorting.
	Medium (500–2,000 lbs/wk)	Bale if possible or consolidate gaylords for live load.
	High (>2,000 lbs/wk)	Bale by type (VCI, printed/unprinted). Maximize trailer weight via compaction.
EPP & EPE Foam	Low (<100 lbs/wk)	Stack in labeled bins or on pallets. Keep dry. Stage on pallets dockside for trailer live load.
	Medium (100–500 lbs/wk)	Palletize, stretch wrap. Consolidate for live load.
	High (>500 lbs/wk)	Densify if available. If not, palletize and stage on trailer. Densified tends to generate more revenue per load.
Polypropylene/Polyester Fabric Bags	Low (<250 lbs/mo)	Collect in labeled gaylords/bins; not worth baling—store and reuse if possible.
	Medium (250–1,000 lbs/mo)	Baling *may* be justified if storage space is tight or shipping consolidation is needed. Consider outsourcing baling if no onsite equipment.
	High (>1,000 lbs/mo)	Bale and stage dockside or on trailer for live-load.

Plastic Corrugate (PP/PE)	Low (<1,000 lbs/mo)	Store by type in gaylords or bins. Remove fasteners.
	Medium (1,000–3,000 lbs/mo)	Consolidate at dock. Stage for trailer or roll-off.
	High (>3,000 lbs/mo)	Consider baling. Partner with recycler for spec-based pickup.
Expendable/Damaged HDPE/PP Pallets (Unrepairable)	Low (<25 units/mo)	Stack outdoors or near dock (if permitted). Consolidate for live load or disposal.
	Medium (25–100 units/mo)	Stage trailer at dock or use roll-off container. Remove metal or non-plastic components.
	High (>100 units/mo)	Stage trailer at dock for regular pickups. Sort by resin if possible. Maximize stack efficiency and ensure loads are contaminant-free.
Damaged HDPE Pails & Totes ("Dry Buck" Items)	Low (<500 lbs/mo)	Can be consolidated with HDPE/PP pallets. Collect in gaylords or on pallets. Ensure items are empty, odor-free, and free of adhesives or liquids.
	Medium (500–2,000 lbs/mo)	Palletize or bulk consolidate by type. Remove lids and rinse if needed. Stage dockside for pickup.
	High (>2,000 lbs/mo)	Partner with a recycler that accepts rigid HDPE. Stage in a dedicated trailer or compactor. Consider washing if dirty or sticky residues are present.

Note: When feasible, materials from similar categories (e.g., rigid plastics, clean poly films) may be mixed into a single truckload to reduce freight costs. Always confirm with your downstream recycler which materials can be co-loaded without affecting bale integrity or contaminating the recycling stream.

Practices for Handling Other Plastic Packaging Wastes

Material	Handling Recommendations
Multi-Material Fabric Bags (e.g., blends of woven PP with liners, foils, or coatings)	- Avoid co-mingling with recyclable fabric bags. - Collect separately in labeled gaylords/bins if recycling outlet has been identified. - Attempt to return to supplier if reuse is feasible.
Nylon, PC/PBT, HIPS, PC/ABS, PPO/PS Trays	- Sort by **primary resin type**; do not mix. - If ESD additives are present, identify and label; this may limit recyclability. - Place in labeled gaylords/bins; avoid using bags. - Clean, dry trays only — remove label backing, foam inserts, or adhesive liners. - For trays with mechanical fasteners or multi-resin structures, separate if practical; otherwise divert from recycling.
Woven Materials (Supersacks, Woven PP Bags)	- Must be **empty, clean, and residue-free** (no powders or liquids). - Bale if possible — densification improves transport cost-efficiency. - Avoid mixing woven materials with soft films. - If reused internally, label and track condition. - If unable to bale onsite, consolidate in gaylords/bins dockside for live load.
TPU Attachments (if disassembled from HMW totes)	- Only include if **fully separated** from parent containers. - Collect by type in labeled gaylords/bins. - Confirm resin type and color when coordinating with recycler — TPU markets are niche and application-specific. - Avoid co-mingling with rigid HDPE or PP.
PP+GF (Glass-Filled Polypropylene) Pallets	- Label clearly as "Glass-Filled PP" — avoid contaminating regular pallet streams. - Do **not mix with HDPE or PP dunnage** unless pre-approved by end recycler. - Stack on trailers or in dedicated staging areas; do not co-load with regular PP. - Fewer outlets exist — coordinate directly with processors familiar with GF resins (e.g., those handling automotive bumper or under-hood plastics). - Clean of labels, adhesives, or metal components.

Paper & Corrugated Board – Identifying Waste Volume & Collection Needs

Material	Low Volume (<1,000 lbs/month)	Medium Volume (2,000–30,000 lbs/month)	High Volume (>30,000 lbs/month)
Corrugated Cardboard (OCC) & VCI Corrugated *(including Kraft Paper)*	Collect in bins (or knockdown cages) through facility. Designate compactor for cardboard recycling only.	Use manual or vertical baler if available. Consolidate at dock for pickup.	Use auto-tie horizontal baler. Stage full trailer for backhaul or mill-direct recycling.
Paper Cores & Tubes	Collect in bins/hoppers and consolidate into an open top for cardboard recycling.	Compact or bale with OCC if compatible. Avoid mixing metal rings.	Shred or cut cores for optimized loading. Bale if recyclable.
Office Paper & Secured Documents	**(<500 lbs/month)** Use 36-gal or 64-gal secured consoles. One console per office area; serviced monthly or biweekly.	**(500–2,000 lbs/month)** Use multiuple consoles or 96-gal lockable carts. Increase service frequency to weekly or twice weekly.	**(>2,000 lbs/month)** Consider offsite service for high volumes. Scale cart or console quantity to match department output.
Office Paper Tip: Choose container size and pickup frequency based on headcount, document sensitivity, and purge schedule. Consoles are best for distributed access; carts for centralized collection.			

Paper & Corrugated Board Best Practices

- **Remove all staples, tape, or banding** when feasible to improve bale quality.
- **Do not include** wax-coated cardboard, laminated materials, or paper with metal/plastic binding.
- **VCI paper and VCI corrugated** are generally repulpable but must be dry and clean of oil or residues.
- **Manual vertical balers** are generally appropriate for up to 30,000 lbs/month.
- **Auto-tie horizontal balers** are generally recommended above 30,000 lbs/month due to volume and labor efficiency.

Note: Never include paper cores with embedded metal rings or OCC with excessive adhesives or moisture — these can result in full load rejection

Wood & Pallets – Identifying Waste Volume & Collection Needs

Material	Low Volume (50 units/month)	Medium Volume (50-200 units/month)	High Volume (>200 units/month)
Solid Wood Pallets, Crates & Dunnage	Stack neatly outdoors (if permitted) or near dock for occasional pickup or disposal.	Use roll-off or stage trailer at dock. Coordinate with reuse vendor if applicable.	Establish recurring trailer program for reuse, grinding, or pallet refurbishment. Remove debris and metal fasteners.
OSB Pallets	Store separately from solid wood. Avoid exposure to moisture.	Load into designated roll-off or container for landfill or grinder.	OSB generally not recyclable — confirm outlet before consolidating at scale.
Plywood Pallets	Same as OSB. Avoid co-loading with clean wood.	Segregate and label. Only some recyclers accept treated plywood for grinding.	Limited reuse potential. If paint or adhesive is present, disposal may be required.
Bamboo Pallets	Treat similarly to paper fiber. Store indoors, keep dry.	Label and consolidate with other fiber-based packaging. Avoid mixing with wood.	Not reusable. May be ground and repulped by a fiber recycler if clean and adhesive-free. Adhesives may limit recovery options.

Wood & Wooden Pallets Best Practices

- Always remove nails, screws, and metal bands if pallets are going for grinding or reuse.
- Keep OSB, plywood, and bamboo separated from solid wood pallets.
- Moisture and adhesives impact recyclability of engineered wood and fiber pallets.
- Label unusual materials clearly (e.g., “Bamboo Pallets – For Fiber Recycling”) to prevent contamination.

Note: If unsure about material type or destination, stage separately and contact your recycling vendor before mixing with other loads.

Metal & Fasteners – Identifying Waste Volume & Collection Needs

Material	Low Volume (<1,000 lbs/week)	Medium Volume (1,000–5,000 lbs/week)	High Volume (>5,000 lbs/week)
Scrap Metals (Steel, Aluminum, Copper, etc.)	Collect in gaylord boxes or small hoppers. Stage at dock for live load pickup.	Use steel hoppers or totes. Empty into 60–80 yd roll-off container.	Continuous collection in roll-off or scrap trailer. Avoid mixing ferrous and non-ferrous when possible.
Metal Banding	Collect separately in labeled gaylords or barrels. Coil tightly to reduce volume.	Consolidate with other scrap metals if accepted. Confirm if separated storage is required.	Same as medium. Segregate by metal type (steel vs. aluminum) if feasible for value and safety.
Electronic Scrap & Wire Harnesses	Store in dedicated gaylord boxes near e-waste or maintenance areas.	Consolidate wire harnesses and other small electronics. Avoid mixing with bulk scrap.	Label and sort by type if possible (e.g., insulated copper wire, PCBs). Use dedicated recycler if hazardous components present.

Scrap Metal Best Practices

- **Ferrous vs. non-ferrous separation** improves rebate value and simplifies downstream processing.
- Avoid mixing **metal banding, e-waste, and scrap parts** in general containers unless explicitly approved by the recycler.

Note: Metal loads contaminated with plastic, foam, or electronics may be rejected or downgraded. Always verify acceptable items with your scrap vendor.

Special Handling Required – Materials Not Accepted in Standard Recycling Streams

Certain materials are more challenging to recycle through standard facility recycling streams. While they should not be placed in primary recycling bins, recycling solutions may be available through specialized programs depending on volume, location, and available markets. Facilities should explore customized recycling options where feasible.

Material
Cross-Linked Polyethylene (XLPE) Foam
Expanded Polystyrene (EPS) Foam
Polyurethane (PU) Foam
PVC (Polyvinyl Chloride)

Note: These materials may require densification or baling to be viable for long-distance transport. Coordination with downstream vendors is critical to avoid contamination or rejection.

Space Considerations for Equipment and Containers

When implementing a recycling and materials collection program, allocate adequate space for equipment such as balers, compactors, and densifiers. As a general guideline:

- *Vertical Baler:* 100–150 sq ft (10' x 10' to 12' x 12'), including space for safe operation and maintenance.
- *Horizontal Baler or Auto-Tie Baler:* 200–400 sq ft (15' x 15' to 20' x 20'), depending on model and throughput requirements.
- *Densifier:* 150–250 sq ft (12' x 12' to 15' x 15') with clear access for material loading and equipment servicing.
- *Compactor:* 100–200 sq ft (10' x 10' to 12' x 16') plus adjacent space for loading docks and truck access.

For lineside collection:

- *Brute Containers (44-gallon):* 5–10 sq ft per container, allowing staff access and safe movement.
- *Gaylord Boxes (on pallets):* 10–15 sq ft per container, plus clearance for pallet jack or forklift access.
- *Self-Dumping Hoppers:* 20–30 sq ft per unit, ensuring safe maneuverability and accessibility for forklifts.

For staging:

- *53' Trailer (Live-Load or Drop-Trailer):* Approximately 1,000 sq ft (8'6" x 53' plus maneuvering space), with appropriate dock height and clear access for loading and unloading.

Evaluate facility layout during the site walkthrough to determine the most practical and safe locations for equipment and collection points. Please note additional recommendations can vary based on business, operational, and other needs at an individual site.

Signage Design Recommendations

To support consistent execution throughout facilities, recycling and waste handling signage should follow the organization's established visual design elements. The following recommendations may be helpful as a starting point for facilities that do not yet have established waste handling visual communications procedures. Please note additional recommendations can vary based on business, operational, and other needs at an individual site. This document is not intended to represent or establish an industry standard practice for signage design.

Poster Sizes

- Wall signage: 11" x 17" (minimum) or 18" x 24" for high-traffic areas
- Container signage: 8.5" x 11" laminated or magnetic signs
- Quick-reference placards: 5" x 7" card-size for deskside or line use

Font Guidelines

- Primary headers: Sans-serif fonts (e.g., Arial Bold) at 72 pt+
- Secondary instructions: 28–48 pt
- Use sentence case for readability; reserve ALL CAPS for section labels only

Color Coding Recommendations

- 🔵 Blue: Cardboard / Paper
- 🟠 Orange: Plastics, Film & Polybags
- 🟢 Green: Wood
- ⚫ Black: Trash / Mixed Waste
- ⬛ Purple or Gray: Electronics & Universal Waste
- 🔴 Red: Hazardous / Special Waste

Label containers on a minimum of two sides.

Visual Elements

- Use high-resolution photos or icons of accepted materials
- Include ✅ and ❌ for accepted/contaminant guidance
- Add location-specific callouts (e.g., "Notify Program Manager when full")

Example Templates

- Available in PowerPoint and Word (sign, placard) fillable formats
- Customizable with facility logos and contacts

Implementation Plan

- **Working Session:** Gather input from EHS, janitorial, shift leads, facilities, and materials teams
- **Site Walkthrough:** Map ideal container placements and space needs
- **Training:** Host kickoff and quarterly refreshers
- **Pilot Phase:** Run pilot in 1-2 facilities
- **Feedback & Finalization:** Incorporate feedback from pilots
- **Full Rollout:** Broad dissemination and support

Appendix: Packaging Recycling Outlet Directory

Depending on the location, volume, and quality of materials there are a range of recycling outlets a site may wish to consider. SP is aware of the following companies in its membership that currently have the capacity to accept certain automotive packaging materials for recycling in North America. Please note that SP does not recommend or endorse any recyclers, and that this information is provided for educational purposes only. Please contact the companies listed directly for additional information.

Goodwill's Green Works (Detroit, MI)

Accepts EPS Foam (#6) and Super Sacks.
Drop-Off Locations:
EPS accepted at all 8 Donated Goods Retail Stores in SE Michigan

Super Sacks and large EPS loads (10+ bags/gaylords) go to:
6421 Lynch Rd, Detroit, MI 48234

✉ Wardell.Allen@ggw-us.org or john.ash@ggw-us.org

Green Processing Company Inc.

Facilities in Windsor (ON), Bowling Green (OH), Laredo (TX) + partners in NC and MX.

Accepts:

- HDPE (structural foam), HMW-PE, LDPE, LLDPE
- PP, PPGF
- Engineered plastics: Nylon, PC/ABS, ABS, TPU
- Mixed pallets and HMW trays

✉ jeremy@green-processing.com

HPJ Industries

Facilities in North Baltimore, Ohio, Laredo, Texas, Deshler, Ohio, and, Eupora, Mississippi.

Accepts:

- HDPE: Bulk Containers, Hand totes, pallets, and lids
- HMW: Therefrom trays
- PP: Totes and parts
- #7: Pallets

✉ patrick@hpjind.com

JSP

Accepts expanded polypropylene (EPP) foam for recycling into new EPP. Works best with clean, stacked formed parts or baled scrap.
✉ steve.sopher@jsp.com

Nefab

Offers take-back programs for custom dunnage solutions, including hard-to-recycle plastics and mixed packaging. Works directly with customers to design for recyclability and close the loop on packaging systems. Also offers a map of wood and plywood recycling outlets.

Nefab Plywood Recycling Directory: https://www.nefab.com/plywood-recycling/

Contact: Rick Demko – Director of Sustainability, Farmington Hills, MI
✉ richard.demko@nefab.com

Nexus Circular

Accepts baled EPE/EPP foam for advanced recycling. Coordinate shipments from facilities that can densify on-site or consolidate sufficient volume for trailer load.

Contact: Dan Todesco – Nexus Circular
✉ dtodesco@nexuscircular.com

Therma Green (via Proper Packaging)

Ontario-based end user of XLPE foam and expanded/beaded PE (EPE). Accepts:

- XLPE in all sizes/densities
- XLPE with PSA or paper backing
- Laminated XLPE (e.g., EVA, thin carpet) – subject to trial

Contact:
Jerry Kiesel – Proper Packaging
✉ Jerry@properpackaging.com

Andrew Mansour – Therma Green (Ontario)
✉Andrew.Mansour@thermagreen.com

Zerust ZeCycle Program

Offers a recycling solution for a wide range of PE bags and films, with a focus on VCI polybags but also accepting other types of films, including ESD bags. Works directly with customers to coordinate recycling pickups, data tracking, and circular solutions to transform materials back into usable VCI products for the industry.

Contact:

Kevin Landmark - Northern Technologies International Corporation (NTIC)
✉ kevin.landmark@ntic.com

Gina McGee - RecycleMax.com
✉ gina@recyclemax.com

Recycling Program Implementation Support Providers

SP is aware of following service providers in its membership available to assist with implementing and managing recycling and waste handling programs in alignment with sustainable packaging practices. These organizations offer a range of services, from onsite staffing and logistics coordination to training and materials recovery. Please note that SP does not recommend or endorse any vendors, and that this information is provided for educational purposes only. Please contact the companies listed directly for additional information.

RecycleMax

Contact: Gina McGee, Business Development Director

gina@recyclemax.com | +1 (248) 505-5247

www.recyclemax.com

RecycleMax is a Detroit-based Total Waste Management firm that partners with industrial and manufacturing facilities to increase recycling and reduce landfill waste. Services include program design, logistics coordination, employee training, data tracking, and cost-saving analysis to support closed-loop and sustainable packaging initiatives.

VMX International

Contact: Vickie Lewis, President & CEO

vlewis@vmxi.com | +1 (586) 291-7778

www.vmxi.com

VMX is an environmental sustainability services company specializing in end-of-life material management recycling, regulatory compliance, and project management services for commercial, industrial, construction, sporting events, and government customers.

Appendix: Abbreviations & Material Reference Cheat Sheet

- OCC – Old Corrugated Containers (Cardboard)
- LDPE – Low-Density Polyethylene
- HDPE – High-Density Polyethylene
- LLDPE – Linear Low-Density Polyethylene
- HMW – High Molecular Weight Polyethylene
- PP – Polypropylene
- PPGF – Glass-Filled Polypropylene
- ABS – Acrylonitrile Butadiene Styrene
- PC – Polycarbonate
- PC/ABS – Polycarbonate/ABS Blend
- TPU – Thermoplastic Polyurethane
- EPP – Expanded Polypropylene
- EPE – Expanded Polyethylene
- EPS – Expanded Polystyrene
- XLPE – Cross-Linked Polyethylene
- PU – Polyurethane
- PVC – Polyvinyl Chloride
- VCI – Vapor Corrosion Inhibitor
- SOP – Standard Operating Procedure

Resources: For additional information on sustainable packaging opportunities for automotive operations, please consult SP's website.