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CONTINUOUS IMPROVEMENT

Magna International

**Panel: End-to-end
sustainability: holistic
approaches to zero
emission, zero waste
manufacturing #AMSLive**
Wednesday 8 December

11:30-12:15

AUTOMOTIVE MANUFACTURING
Evolution
SUMMIT LIVE

Who We Are

Since 2002, Suppliers Partnership for the Environment (SP) has been the leading forum for global automakers, their large and small suppliers, the US EPA and other government entities from around the world to work together to improve the environmental sustainability and business value of the global automotive supply chain



SP Members & Liaisons

- ▶ We welcome automakers and their suppliers to join us in our mission to improve the environmental sustainability of the auto supply chain.

SP Sustainable Packaging Guidance Recommendations (November 2020)



Sustainable Packaging Specification Recommendations for Automotive Manufacturing Operations

November 2020

Following are recommendations that will help automotive original equipment manufacturers (OEMs) source sustainable packaging designs for use in automotive manufacturing operations. These recommendations focus on opportunities to minimize automotive packaging waste and address barriers to recyclability in the design phase, detailed guidance on sustainable management of packaging waste streams at the site level is outside the scope of this document.

Please note, additional recommendations and design variations can vary, based on business goal alignment, package material availability and reuse as well as recycling infrastructure issues based on geographic location. It is recommended that these specifications are entered into sourcing packages and other product sourcing documents as needed, typically described as Statement of Requirements (SORs) or Terms and Conditions to influence conformance. In order to assure conformance to a sustainable packaging system, an internal monitoring program should be in place to track, measure and formally approve package design conformance by environmental or sustainability team personnel.



- When building business cases for packaging design and logistics, include and communicate to procurement/purchasing/supply chain managers a total enterprise financial scope that considers all corporate goals and strategies including health, safety and the environment.
- Whenever possible, source parts, modules and other products using returnable packaging and base this decision on life cycle factors.
- Avoid using foams in packages that include spacers and dunnage if possible, as most foams (polystyrene, polyurethane and other thermoset products) are difficult to recycle.
- If a foam packaging product is sourced, expanded polypropylene (EPP) may be more recyclable than other foam options. **EPP foam containers are commonly used for products in need of surface protection and nesting within the container and is used as a returnable container option over a product's entire life cycle. Reuse options for EPP foam formed containers are limited outside of the original packaging application. EPP foam second use options can include densification and resin creation for new products.**
- Combination packaging (specifically incorporating multiple materials) should be avoided whenever possible. When unavoidable, materials should be able to be segregated without requiring significant time or force.
- Pallet and container separation ease improves reuse and recycling potential. Avoid using screw fasteners, nails or staples to attach cardboard/old corrugated container (OCC) boxes to wood pallets. **Alternatively, secure the box to the pallet using** plastic banding that wraps around the box and secured to the pallet through the fork spaces. Also, consider sourcing OCC pallets that are fastened to the boxes or manufactured as part of the container. These designs improve the recyclability of the entire package. Please note, some OCC pallets have limitations based on moisture compromise, weight capacity and stacking limits.
- Avoid using metal clips on plastic banding. Plastic banding should be secured using plastic weld (sonic) technology.
- Avoid using metal brackets and wood to reinforce cardboard/OCC boxes. Oftentimes cardboard brackets and spacers can reinforce boxes where needed.



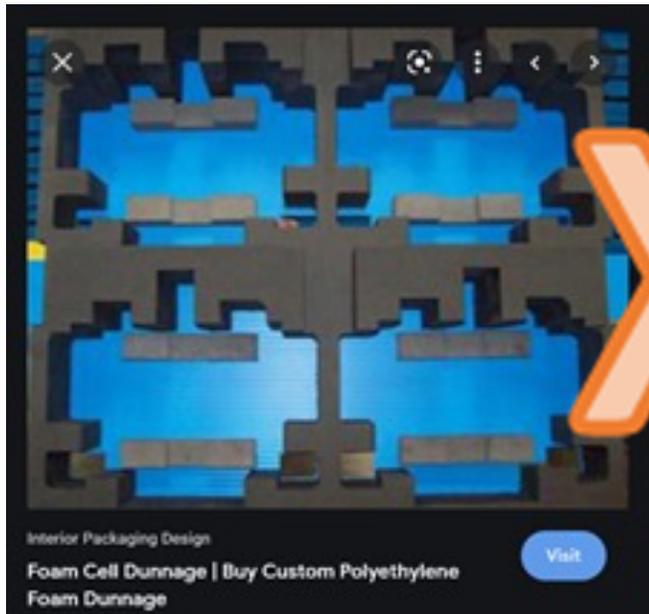
- Whenever possible, avoid one-time use packaging and assembly aids. These packaging aids, commonly called caps and plugs, can be cleaned, inspected and reused to protect fittings, threaded fasteners and ports. **Whenever possible source in neutral colored polyethylene packaging aids.** Please note that sometimes colors are used as visual aids, where possible consider the use of alternative options to achieve the same goal.
- Plastic corrugate, which many times is polypropylene, should not be sourced with mixed plastics or metal fasteners unless material is intended for reuse. This material, when clean and used without fasteners can be densified for recycling as well.
- LDPE plastic bags and bubble wrap and other film can be reused or baled and placed into a plant recyclable film program. These materials can also be reused internally, or sent to non-profits, small local businesses as well as sent back to the supplier for reuse.
- Polypropylene and polyester fabric bags that may be used to protect class A surface parts from mutilation such as lighting fixtures, fascias, chrome parts, etc. can be placed in the container and sent back to the supplier for reuse where feasible.
- Use of expanding polyurethane foam in packages should be avoided, especially when formed within plastic bags. This package material creates a significant challenge for recycling and reuse. Consideration could be given to using bio-based or polypropylene and polyethylene foams if a local reuse or recycle solution is found. Although many reuse options exist, foams are typically a challenge to recycle.
- If a Logistics Optimization Center (LOC) is used to service nearby manufacturing operation(s), then efforts to concentrate and manage expendables for reuse and recycling at this location should be done. Aftermarket parts locations can also help consolidate materials for this purpose. These strategies create consolidation points for improved material management.
- In order to continually improve the life cycle management of containers and packages entering manufacturing operations, enlist the participation of environmental professionals located at the first point of package use and at the destination point after first use so local considerations can be incorporated into package designs.
- Wood pallets sourced in the US should be 40" X 48", 42" x 48", or 45" X 48" whenever possible, with the auto industry using 45" x 48" for production and 42" x 48" for service. The food and beverage industry uses 40" X 48 primarily. These sizes greatly improve the possibility for these pallets to be reused as compared to off-spec sizes.



Thermoset Foams

Avoid using foams in packages that include spacers and dunnage if possible, as most foams (polystyrene, polyurethane and other thermoset products) are difficult to recycle.

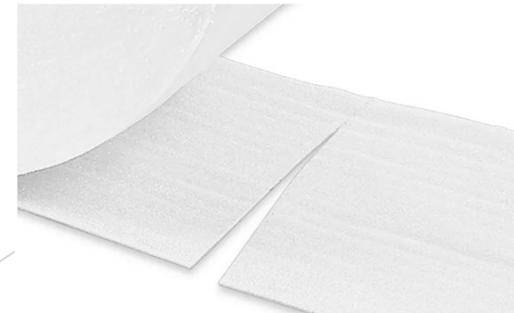
- Crosslink foam is a thermoset and doesn't get recycled
- EPE does not out-gas like Crosslink foam does



Thermoform Foams

If a foam packaging product is sourced, expanded polypropylene (EPP) may be more recyclable than other foam options. EPP foam containers are commonly used for products in need of surface protection and nesting within the container and is used as a returnable container option over a product's entire life cycle. Reuse options for EPP foam formed containers are limited outside of the original packaging application. EPP foam second use options can include densification and resin creation for new products.

- The Recyclability of EPP is a matter of supply and demand.
- Usually purchased as spot buys rather than contracts.
- 15% of post industrial off-spec material can be put back into product
- 25% of post consumer recycled product is current content (EPP manufacturers Don't know who or where the end user is, need to provide contact info at Launch)
- Specifications to recycle include melt flow and ethylene content
- All products are one color with specks of accent colors if needed
- Densifiers are not expensive and don't take up much space \$17-30K
- Mexico recycling is not mature
- Canada can send their materials to the US to recycle but there are rules



Film Baler



Stretch Wrap Baler



SINOBALER[®] YOUR BALING SOLUTION

PE Film Baler



EPP foam Densifier



Hot melt densifier

Stretch Film

At between 2,000 pounds and 4,000 pounds per month: you'll earn the most revenue with a downstroke baler. Most companies put their baler into double duty service, processing OCC with LDPE. You will earn the highest revenue by storing loose plastic films in gaylords until there's enough for a bale (16 gaylords loose LDPE = 1 bale). Or you can make sandwich bales. Do this by loading OCC, adding 4-6 gaylords of shrink wrap, then fill the rest of the way with OCC. You won't earn as much back, but you'll save valuable floor space.

every ounce of weight you save from the landfill is money in your pocket



Caps and Plugs

Whenever possible, avoid one-time use packaging and assembly aids. These packaging aids, commonly called caps and plugs, can be cleaned, inspected and reused to protect fittings, threaded fasteners and ports. Whenever possible source in neutral colored polyethylene packaging aids. Please note that sometimes colors are used as visual aids, where possible consider the use of alternative options to achieve the same goal.

- Caps and Plugs are usually specified by the company responsible for warranty
- Red, Yellow, Black and White are the predominant colors used by Magna
- Materials are HDPE, nylon, PPE and LDPE



EPDM is made from ethylene, propylene, and a diene comonomer that enables crosslinking via sulfur vulcanization.

Low-density polyethylene (LDPE) is a thermoplastic made from the monomer ethylene. The EPA estimates 5.7% of LDPE (recycling number 4) is recycled in the United States.



Protective Films

Protective tape can have bio-assimilation Catalyst added to allow it to break down in The landfill

A better solution is to use a tape that can Be recycled to get the worth of the material.



Time to apply on a Hyundai i20 00:00:52

AutoWrap

Use of expanded polyurethane foam in packages should be avoided, especially when formed within plastic bags. This package material creates a significant challenge for recycling and reuse. Consideration could be given to using bio-based or polypropylene and polyethylene foams if a local reuse or recycle solution is found. Although many reuse options exist, foams are typically a challenge to recycle.

- Currently Foam in bag can't be recycled
- Alternatives are already in place including air filled paper products



Wooden crates, even for small batch shipping use, should be designed with ease of disassembly for reuse and/or shredding for recyclability in mind. Often, wooden crates are assembled using plate steel and bolts that unnecessarily make recycling very laborious and costly.

- There isn't a system currently that has expendable solid wood without fasteners
- There is an option to use returnable wood crate with a 6:1 return ratio
- An expendable option would be a solid wood pallet with a triple wall corrugated board sleeve and lid



ULINE
Wood Crate - 72 x 48 x 48"
\$369.00* · In stock
"Vault-like" protection for your export shipments. Ships flat for easy storage. 1/4" thick plywood. Outside dimensions include 5" pallet. Assembles in ...



ULINE
Heavy Duty Wood Crate - 48 x 48 x 48"
\$565.00* · In stock
Heavy-duty protection for your most valuable international shipments. 3/4" thick plywood. Removable front panel for easy loading. Quick, no-tool ...



Clip-Lok Containers
Innovative Wood Collapsible Returnable / Expendable Containers
No Nailing / No Banding / No Screws / sets up in minutes

- No size limit
- Use of returnable plywood or limited OSB materials
- Can stack 40,000 # static
- Hold up to 10,000 # in a single container
- Removable panels
- Easy maintenance
- Can get over 100+ turns
- Global manufacturing locations & support

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Thank you for being sustainable!!!

