# direct to consumer

# Product Review: Wine Shippers



Shipping containers hold a winery's most precious cargo. From damage protection to environmental concerns, what matters most when selecting which product to use?

### Mary-Colleen Tinney

**OVER THE LAST** several years, two of the most talked-about trends in the wine industry have been increasing consumer-direct sales and reducing a winery's environmental impact. These trends converge when wineries choose containers for shipping their wines to individuals, either to consumers or to others in the trade.

Wineries must consider several different factors before choosing shipping materials. Environmental friendliness is a top concern encompassing not only recyclability for the end user but efficiencies in manufacturing, transportability and storage. The majority of wineries are most concerned with the integrity of their shipments as the sole reason for the packaging is to protect wine from damage, including insulating against temperature swings and preventing breakage.

The most commonly used products for shipping are:

- Corrugated cardboard
- Molded pulp
- Molded PET plastic
- Expanded polystyrene (EPS), more commonly known as Styrofoam (though that name is trademarked by **Dow Chemicals** and true Styrofoam is not used for wine shipping materials).

Other shipping insert alternatives exist, including packing peanuts, plastic air pouches and alternative foams, but the use of these materials in the wine industry is limited. Wineries must ensure that the materials they intend to purchase have been tested and certified.

Wineries must decide which materials are the best products, after considering the shippers' protective properties, environmental impact, cost, storage space and ease of use.

Susan Mahler, owner of Four Vines Winery in Paso Robles, California, said environmental concerns are the primary reason they ship their wine in molded pulp made of recycled fiber. Another motivation stems from the various designs that are offered: upright and laydown versions that hold two to 12 bottles. "You can get a laydown version-and if you're shipping to a customer, it's a nice presentation because the labels can be sent facing up," Mahler said. Plus, she said, "They're stackable and take up a lot less space than Styrofoam [EPS]," which is used "only if shipping during the summertime to places where it's very hot, like Arizona."

**Peter Kay**, director of sales and marketing for **Peter Michael Winery** in Knights Valley, California, said although the environment ranks among the winery's top concerns, they choose to use EPS because it offers "the best insulation factor of anything available. We want the wine arriving intact and having been shielded from the elements to the greatest degree possible, and the customer having the impression that we care about these things, because we do," he said.

Among the reasons he cited for using EPS included the traditional and natural processes by which their wine is made. "Our wines are not fine filtered or cold stabilized. The lack of fining means that we don't have the level of protein stability in our wines that more typical commercial processing would lead to. As such, our wines are more temperature-sensitive when it comes to storage."

#### DAMAGE PROTECTION

Every winery—regardless of environmental philosophy—needs their wines to arrive safely and at optimal quality. Unfortunately, shipping is notoriously tough on packages and becomes more difficult when increasing the number of bottles being sent or sending the wine over long distances. Although the major shipping companies do work to minimize handling damage, the rough nature of the delivery process itself is problematic.

Breakage is one of the most common

(and most obvious) problems. For a material to effectively safeguard the wine, it needs to keep the bottle away from the walls of the box. A bottle that sits directly on a cardboard shipping box has almost nothing to diffuse the sharp jolts of the shipping process. Functional shipping materials absorb and disperse these shocks, thus preventing breakage.

The International Safe Transit Association (ISTA) and shipping companies FedEx and UPS have developed strength and integrity tests for wine packaging. Usually referred to as "drop tests," these assess how much shock the material can absorb without causing breakage. Those that meet or exceed standard criteria are certified. Additionally, many shipping product manufacturers also research and test their shippers to ensure they meet company-defined standards.

Each of the four major shipping materials discussed in this story has passed these certification tests. However, that does not mean each vendor is offering certified supplies. Wineries must ensure that the materials they intend to purchase have been tested and certified. While non-certified materials may be as good or better than certified products, more than likely, wineries are not willing to experiment.

Weight is also a factor in breakage, one that obviously increases with the number of bottles being packed and the materials being used. With lay-down-

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ally result in the best protection. Again, being carrier-certified ensures that, at the very least, the tray meets minimum breakage standards.

Plastic Inserts. Plastic inserts are generally as successful as molded pulp in protecting against breakage. There is little concern about quality differences between manufacturers, but wineries should ask about how the design features of the tray work to protect the bottles. The answers will give wineries a better understanding of how the wine is protected and more confidence in their use.

Corrugated Cardboard. Wineries using corrugated cardboard inserts have also found them to be successful against breakage, assuming that they are well-designed and carrier-certified. Corrugated shipping inserts that offer the best protection set the bottle on a shelf above the bottom of the shipping box and have other design elements that secure the bottles and prevent them from moving. These styles ensure the bottles aren't in contact with the box and that they aren't being jostled during transport.

Another corrugated insert style is a thick double-walled cardboard. Though there is not as much separation between the bottle and the box with these designs, there is some insulation to keep the bottles from direct contact with the box. However, this style is generally not robust enough to protect bottles during rough, long-distance transport.

#### THERMAL ISSUES

Wines can be damaged if a shipment reaches temperatures that are either too high or too low. Most wineries try to avoid the problem altogether, usually by holding shipments and wine club releases during high-risk months. If a shipment must be made, the wine is commonly sent overnight or secondday air in order to mitigate concerns about the package sitting in an unprotected warehouse or railyard.

Wineries have also devised other remedies. An ice or cold pack can be included in the box before shipping, and one winery contacted for this story indicated that they have even added a frozen bottle of water to worrisome shipments. Wineries using molded pulp or cardboard need to be careful about keeping the inserts dry because their strength will be reduced if the material becomes wet.

Many fulfillment houses or other vendors have developed products that offer additional protection against temperature damage. Some guarantee that temperature is controlled through much of the shipping process (in climate-controlled warehouses and refrigerated trucks, for example), while others offer cooling systems or insulation against temperature changes. These solutions, however, may be too expensive or unattractive for some wineries.

In terms of shipping materials, EPS again offers the best thermal protection, at least initially. The bulky, insulating foam slows temperature changes within the shipping box, and thus provides more hours of protection. However, if dangerous temperatures are reached, EPS is the slowest to return to a safe temperature. If the shipment does become overheated, EPS retains that heat longer than other materials.

Molded pulp, corrugated cardboard and plastic inserts offer good, but somewhat more limited, thermal protection. The relatively thin materials are not as capable of insulating the wines against temperature changes as the bulky EPS. However, wines are still protected with these materials for several hours before reacting to dangerous temperatures, perhaps just an hour or two less than they would be with EPS. The benefit of these materials, though, is that dangerous temperatures reached during shipping are not maintained for as long as they are with EPS. Still, wineries may need to take additional steps, such as added insulation or cold packs, to protect the wines if temperature damage is a concern.

#### ENVIRONMENTAL CONCERNS

For some wineries, the environmental friendliness of the shipping material is more important than its protective qualities. Virtually all wineries contacted for this story indicated that the environment was one of the main factors in their insert material choice. Recyclability is a major issue, but factors such as manufacturing process and shipping issues are also concerns.

style shipping inserts, the bottles on the bottom of the case are supporting much more weight than those at the top. However, weight is less of an issue for stand-up shipping configurations. The molded pulp standup configurations eliminate many of these weightbearing concerns.

#### **MATERIALS' PROTECTIVE** PROPERTIES

If the shipping product-no matter what the material-is certified by ISTA or a shipping company in drop tests, breakage should be much less of an issue. It has long been thought that wines shipped in EPS were the least likely to suffer breakage. Indeed, EPS absorbs the usual bumps and jolts of shipping, and breakage of wines shipped with this material is extremely uncommon. It is largely for this reason (coupled with the material's thermal protection) that some wineries trust only EPS for shipping all or some of their wines. Still, for particularly turbulent shipments, "Even EPS gets thrashed," said one Napa Valley tasting room manager. However, the integrity of the bottles is usually maintained even in these shipments.

In drop tests, other inserts usually perform nearly as well or the same as EPS. In actual usage by wineries, though, the effectiveness of these other materials is a matter of some debate. While one winery might insist that breakage has not increased after switching to corrugated cardboard,

molded pulp or formed plastic, another winery might be equally insistent that damage incidents have risen after the switch. The disparity might be attributed to the quality of the products used rather than the material chosen. Quality levels can vary between different vendors or product designs, so wineries need to carefully examine and compare products before making a choice.

#### **QUALITIES OF SHIPPERS**

Molded Pulp. Molded pulp is made from paper and/or cardboard fibers (though, on rare occasions, other additives may also be used). Most of the time, cardboard fibers are sourced from recycled cardboard, while the paper fibers are usually from recycled newsprint (though other fibers may also be used). Performance does not necessarily depend on the type of materials used, but the quality of the raw materials is important. How the travs are designed and made is another important factor.

For molded pulp inserts, the differences between products could include wall thickness, rigidity, fiber length (cardboard has short fibers, while newsprint has long fibers), fiber density, raw materials used in the composition of the pulp and, finally, the manufacturing and molding process. Regardless of whether the trays are made from newsprint, paper or cardboard, high-quality raw materials and a well-researched and tested design usu-





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Wine Shipper Performance									
Material	Breakage Protection	Thermal Protection	Recycleability	Environmentally Friendly	Cost	Storage			
EPS (Styrofoam)	••••	••••	•	•	\$\$ to \$\$\$	•			
Molded Pulp	•••	••	••••	••••	\$ to \$\$\$	•••			
Corrugated Cardboard	• to •••	••	••••	••••	\$ to \$\$	••			
PET Plastic	•••	••	••••	•••	\$\$\$\$	••••			
• poor •• fair ••• goo	od •••• excellent								

**EPS.** By all accounts, EPS is the least environmentally friendly shipping product—from the manufacturing process down to the recyclability for the end user. Many people are frustrated with EPS—some areas are even considering a ban on their use. Other forms of EPS, such as fast food containers, have already been banned in many areas throughout the country.

EPS is a petroleum-based material, thus fossil fuels are a necessary component in its creation. It takes thousands of years for EPS to break down. Also, recycled materials are not often used in production of EPS, though this is changing as the consumer acceptability of foam declines.

The bulkiness that protects wine against breakage and temperature damage also causes storage and shipping issues. EPS takes up a lot of space during transport, requiring more truck space and, thus, more resulting emissions than an equivalent number of molded pulp, plastic or cardboard inserts.

Recycling for the end user is a problem. Very few, if any, curbside recycling programs are available for EPS; even finding a nearby recycling facility can be difficult. Some programs enable people to send EPS via the mail to be recycled, but that takes a significant effort on the part of the consumer. Wineries can direct consumers to the

Alliance of Foam Packaging Recyclers website (*www.epspackaging.org*) for more information about EPS recycling locations, including mail-in facilities. Some vendors and third-party fulfillment houses will also accept EPS prod-

#### AT A GLANCE

Here's a quick overview of the most commonly used materials for direct wine shipping.



**EPS**, commonly known as Styrofoam (although the trademarked material is not used for shipping wine), was traditionally the choice for wine shipping in years past. The bulky, thick material is especially adept at insulation and absorbing the shocks of the shipping process, pro-

tecting the wines from temperature-related damage and breakage better than any other insert. There are several drawbacks to the material, however, including its high expense and shipping costs, and amount of storage space needed. EPS is usually durable, though some formulations can flake or bead off and leave residue on bottles. EPS is easy for wineries to use during the packaging process.

Experts believe that EPS takes thousands of years, perhaps even tens of thousands of years, to biodegrade. Although manufacturers are working hard to develop more environmentally friendly versions of the foam, EPS is the least "green" of any shipping insert.



**Molded Pulp** pulp has become a very popular option for wineries over the last decade and is probably the most widely used shipping insert in the wine industry today. Molded pulp performs well in drop tests and has proven to be very good at protecting wine against

breakage. The trays also offer a reasonable amount of insulation from temperature changes.

It is one of the most economical options overall and has space-saving features during storage and shipping. Though usually durable, some trays can tear or are difficult to un-nest during case packing.

Recyclability and environmental friendliness are perhaps the strongest advantages that molded pulp has over other materials. The percentage of recycled materials used in production can vary from zero to 100 percent. Generally speaking, all trays can be curbside recycled along with other paper materials. Some molded pulp trays can be composted, a claim that is only supposed to be made after the pulp has gone through a certification process. Even if molded pulp products find their way into landfills, they are proven to biodegrade within a few years.



**Corrugated Cardboard** is a viable option, particularly for smaller wineries that don't have high-volume direct shipping programs. Insert designs vary, but the most successful (and most widely used) are the highly engineered versions (such as those with shelves and tabs to

keep the bottles from shifting or absorbing the vibrations and shockwaves of the shipping process).

Cardboard tends to be somewhat expensive, usually falling between EPS/molded fiber and formed plastic. The inserts are shipped and stored flat, so storage is less of a concern for wineries, though the heavy shipments can be costly. Cardboard is rather sturdy, but most designs cannot protect the wines from breakage as successfully as EPS, molded pulp or formed plastic. Cardboard is also very environmentally friendly, can be curbside recycled, quickly biodegrades and is often manufactured using recycled materials.



Formed Plastic Trays are the newest alternative for wineries, though they currently serve a niche market. Plastic inserts are likely to gain in popularity, however, as wineries grow more confident in the material's ability to keep the wine safe from breakage. The material

also offers wineries the unique opportunity to print marketing messages on the interior of the box, which could be seen through the clear plastic tray.

One of the biggest advantages of plastic trays is that a large number of inserts can fit into a relatively small physical footprint. The thin, smooth trays fit snugly together while they are nested and stacked. The plastic is durable and easy-to-use; although the lay-down design requires the same time-consuming packing process as molded fiber lay-down trays.

Currently, plastic shipping inserts are the most expensive of the major shipping inserts. Despite that, more wineries are choosing the product. The trays are curbside recyclable, but they are a petroleum-based product and they do not quickly biodegrade if they end up in a landfill. **wbm** 



ucts for recycling, or consumers may find a local wine shop or shipping facility willing to take their leftover shippers to be reused or recycled. However, finding places willing to accept EPS can be difficult and consumers might also be unmotivated to make that effort.

Producers are working to improve their environmental sensibility. Several EPS manufacturers are beginning to incorporate more recycled materials into their foam production. There are also efforts to create curbside-recyclable molded foam similar to EPS, or to develop a hybrid product that combines the safety and insulation of EPS with the recyclability of molded pulp or corrugated cardboard.

"We use a mixture of foam and pulp," said James Drake, shipping and compliance manager for Domaine Carneros Winery. "Our bottles that we are sending out from here tend to be thicker, heavier and maybe wider at the base than other bottles. They don't fit in the standard pulp shippers, so we have extra-large shippers in foam." While their wine club shipments go out via a third party using pulp, all inhouse shipments are packed in EPS, including post-consumer foam called **EnviroFoam**.

**Molded Pulp.** As a paper and/or cardboard-based product, molded pulp is extremely environmentally friendly. The fiber is typically made with recycled materials, though the percentage depends on the manufacturer. The trays are also easily recycled and are accepted by most curbside recycling programs. If the trays do end up in landfills, molded pulp only takes a few years to biodegrade.

Several manufacturers are now selling trays that degrade fully in the composting process, a claim that can only be made after the product has been certified. Even without the certification, many trays can be composted. Unless a company has been certified, wineries and consumers can't be sure that harsh or toxic chemicals aren't

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used in the manufacturing process. Some manufacturers do use harsh, though not necessarily harmful, chemicals in their production process.

If environmental impact is important to the winery, another concern might be where the trays are manufactured. Facilities in countries without strict environmental controls might not be as "green" as a facility located in the U.S. or other environmentally aware countries.

As a stackable, nestable product, molded pulp takes up far less space than EPS in warehousing and delivery. How tightly the trays can be nested depends on the manufacturer. The lip of some trays sits almost directly on top of the tray below, while other manufacturers might have a large gap between each tray.

Wineries are advised to learn as much as they can about the manufacturing process of each prospective vendor before they settle on a final choice. Specifically, find out about manufacturing locations, chemical use during production, raw material sourcing and the ratios of paper and cardboard used in the pulp.

**Cardboard and Plastic.** Corrugated cardboard and formed plastic shipping inserts can be recycled through most

curbside recycling programs and are usually made with at least some recycled raw materials. Cardboard inserts are also space-efficient, as they are usually shipped and stored flat and are only unfolded and/or constructed when the shipment needs to go out.

However, plastic, like EPS, is a petroleum-based product and its manufacture does require the use of fossil fuels. Formed plastic trays are nestable and stackable and take up less space than even molded pulp trays. Because the material is smooth with thin walls and almost zero variation in the bottle indentations, the trays are easily and densely nested together. Currently, the main producer of plastic inserts is a company located in the Pacific Northwest. Although the shipments are densely packed and have a small physical footprint, a winery may want to consider the environmental impact of shipping distance in their overall evaluation.

#### COST

Shipping-insert pricing is dependent on the quality of the material, quantity ordered and the manufacturing process, among other variables. A wide array of choices is available at any price point, and sometimes they overlap.

"It really is a very intricate puzzle," said Kay of Peter Michael Winery.

Wine Shipper Manufacturers								
Company	Location	Phone	Web Address	Products				
Brick Packaging	Traverse City, MI	231-947-4950	www.brickpackaging.com	molded pulp				
Coastal Products	Vineburg, CA	707-935-1608	~	EPS and molded pulp				
E. Beaver & Co.	Bronx, NY	718-324-7288	www.ebeaver.com	EPS, molded pulp and corrugated cardboard				
EnviroPAK Corporation	St. Louis, MO	314-739-1202	www.enviropak.com	molded pulp				
Fagerdala World Foams	Lompoc, CA	805-735-5205	www.fagerdalausa.com	EPS and Envirofoam (a recycled foam product)				
Henry Molded Products, Inc.	Lebanon, PA	717-273-3714	www.henry-molded.com	molded pulp				
Keyes Fibre Corporation	Wenatchee, WA	509-663-8537	www.keyespackaging.com	molded pulp				
Longview Fibre	Oakland, CA	510-569-2616	www.longviewfibre.com	corrugated cardboard				
Moresco Distributing Company	Petaluma, CA	707-773-2500	www.moresco.biz	EPS, molded foam and molded pulp				
Napa Valley Shipping & Packaging Co.	Napa, CA	707-224-7447	www.cartonsandcrates.com	EPS and molded pulp				
Pacific Coast Container (Cal Glass)	Oakland, CA	510-635-7700	www.calglass-pcc.com	EPS				
Pacific Pulp	San Diego, CA	619-977-5617	www.pacificpulp.com	molded pulp				
Pacific Southwest Container	Modesto, CA	209-526-0444	www.teampsc.com	corrugated boxes, flexo- and litho-printed corrugated shippers				
Pacific Western Container	Santa Ana, CA	800-241-3513	www.pacificwestern.com	corrugated cardboard, EPS				
Packaging Plus	Lathrop, CA	707-558-8900	www.pkg-plus.com	EPS, molded pulp and formed plastic				
Pioneer Packaging	Livermore, CA	800-472-2546	www.pioneerpackaging.com	EPS, molded pulp and corrugated cardboard				
Pride Polymers, LLC	Yakima, WA	509-452-3330	www.pridepolymers.com	formed plastic				
Protexic Brands, Tegrant Corp.	New Brighton, PA	800-289-9966	www.protexic.com	EPS				
Standard Packaging Corp.	Gardena, CA	310-719-7000	www.standardpackaging.com	corrugated cardboard				
The Spirited Shipper	Long Island City, NY	800-730-7447	www.spiritedshipper.com	corrugated cardboard				
U-LINE	Ontario, CA	800-295-5510	www.uline.com	EPS, molded pulp				
UniSource	Santa Rosa, CA	707-526-7805	www.unisourcelink.com	molded pulp				
Universal Foam Products	Hunt Valley, MD	410-825-8300	www.univfoam.com	EPS				
Waterloo Container Co.	Waterloo, NY	315-539-3922	www.waterloocontainer.com	cardboard UPS shipping boxes, cartons				
Western Pulp Products Company	Corvallis, OR	541-757-1151	www.westernpulp.com	molded pulp				
Wine Packaging by Naylor	Stewartstown, PA	800-292-3370	www.naylorpackaging.com	corrugated cardboard				
Wine Packs	Clinton, IA	800-372-3126	www.winepacks.com	molded pulp				

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"There is no perfect solution. There really isn't because it isn't cost effective to put the wine in a temperature-controlled truck and drive it directly to the customer's doorstep. We're paying a price premium to do it in Styrofoam [EPS]. We do that unflinchingly, because of our perception of the quality issue and answering our customers' desires to have the wine arrive without any sort of damage."

However, Four Vines Winery's Mahler said they have used molded pulp since 2001 and have never experienced any issues with breakage.

There is a wide range of prices for inserts, from budget to luxury prices,

though formed plastic inserts are less variable in cost. Depending on quantity price breaks, prices for shipping inserts can range from as low as \$0.50 per item (generally for a very large order of molded pulp trays or basic corrugated inserts) to as much as \$15 per item (for a small order of 12-bottle EPS shippers).

Several years ago, EPS was the most widely used and cost-effective choice in shipping inserts. However, prices have risen along with the falling demand for the product and the volatile cost of oil. Though prices of all shipping inserts can vary widely between vendors, EPS generally costs less than plastic inserts, about as much or more than molded pulp and more than corrugated cardboard. As discussed earlier, shipping costs of EPS are generally higher than other materials because of the larger physical footprint of the shipments.

Only a few sources exist for plastic trays, which may contribute to the product's higher cost. The lack of competition, relatively small demand and unpredictable raw material costs are other factors. As more wineries become aware of the viability of formed plastic trays, demand for the product will likely increase and lead to lower prices.

It wasn't too long ago that molded pulp trays were serving only a niche

segment of the wine industry and the cost of the fiber trays reflected that status. As usage of molded pulp boomed, prices fell significantly. Today, these inserts are one of the most costeffective choices for wineries, though price is usually dependent on the quantity, quality and design of the insert. Molded fiber is generally less expensive than EPS or plastic.

If choosing a very basic, less-secure design, corrugated cardboard is the only other insert that can consistently be purchased for less than molded fiber. However, most cardboard inserts used for wine shipments are higher priced than either EPS or molded pulp. **wbm**