

Pallet basics

Pallets, the base of most modern materials handling systems, do more than carry loads. Applied correctly, they can also protect their loads—as well as the supply chains through which they travel.

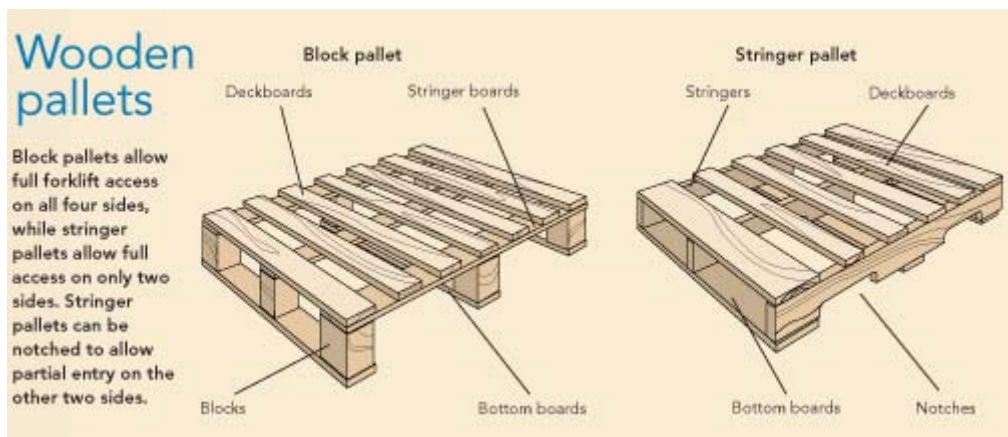
By Corinne Kator, Associate Editor -- Modern Materials Handling, 5/1/2008

You probably see them every day. However, the more you see something, the more you tend to take it for granted. Take pallets, for example. Simply, a pallet is a portable platform, usually made of wood, which facilitates the movement and storage of unitized goods. However, do you know how pallets help protect products from damage? We'll get into that, but first a bit more about pallet origins.

Stacking goods on pallets and moving those pallets with lift trucks became a popular handling technique of the U.S. military during World War II. The technique spread rapidly after the war, and today the pallet is a fundamental component of most modern materials handling systems.

Wooden Pallets

The vast majority of pallets in use today are made of wooden boards held together by metal fasteners.



Wood is the favored material for pallets because, in most places, it is readily available and relatively inexpensive. (A typical wooden pallet costs about \$9 in the United States today.) In addition, wooden pallets are easy to assemble, and wood is easily adaptable to the many different pallet designs demanded by industry.

Here's where we start to talk protection. First, let's address supply chain protection. Wooden pallets that transport goods between countries often need to be heat-treated or fumigated to ensure no diseases or disease-carrying pests are living in the wood. Treated pallets are marked with a stamp developed by the [International Plant Protection Convention](#) to show they are in compliance with phytosanitary regulations.

Many different types of wood are used. It's common to categorize pallets as hardwood pallets or softwood pallets, but this is a risky distinction because not all hardwoods are particularly hard, and not all softwoods are particularly soft, says [Marshall White](#), president of the consulting firm White and Co. (800-942-7943, www.whiteandcompany.net) and former director of the [Pallet and Container Research Lab at Virginia Tech](#).

When you're choosing a wood for your pallets, says White, “forget about soft or hard.” Instead, look at the individual species available (pine, oak, birch, etc.), and compare their prices and strengths, he says.

When it comes to fasteners, the most common choices are staples and threaded nails. Both are good fasteners, White says, but both can vary widely in quality. Improving the quality of your fasteners significantly improves pallet performance without adding much to the pallet's price. It will also help protect your loads from damage.

Wooden pallet design

Most wooden pallets fall into one of two basic categories: stringer and block. Both types of pallets have a top deck of boards on which the load rests; the difference is in the frame that supports the deck.

Stringer pallets use a frame of two or more boards (called stringers) that run the length of the pallet, perpendicular to the deck boards. Most stringer pallets contain three stringers: one along each side and one that runs down the middle (see illustration). Stringer pallets are two-way pallets, meaning they permit [forklift](#) entry in their two opposite ends. Many stringer pallets are notched on their sides to allow partial four-way entry.

Although no universal standard exists for stringer pallets, the [Grocery Manufacturers of America](#) (GMA) pallet is the most common design in use. It measures 48 inches long by 40 inches wide, and is most often used to meet the minimum requirements of downstream customers at the least possible cost.

The frame of a block pallet is made of three stringer boards supported by blocks of wood (see illustration). Most block pallets have nine blocks: one at each corner, one on each side, and one in the center of the pallet. Most block pallets are true four-way pallets, meaning they permit forklift and pallet truck entry on all four sides.

Both stringer and block pallets usually have a series of bottom boards underneath the frame. Pallets with the same number of boards on the top and bottom are called reversible pallets, as they can be used with either side up. Pallets with no bottom boards are known as skids.

Other pallet materials

While traditional wooden pallets dominate the market, pallets are available in a variety of other materials. The most common of these alternatives are plastic, metal, paperboard and specialized wood.



Plastic

Plastic is the most popular alternative material for making pallets. The exact characteristics of plastic pallets vary depending on the type of resin and the molding technique. In general, however, plastic pallets are lighter and more durable than wooden ones. They are also more uniform in size, shape and weight.

Plastic is considered more sanitary than wood: It doesn't absorb moisture and is easy to clean. This makes plastic pallets a popular choice for transporting food and beverages. In addition, plastic—unlike wood—doesn't need to meet phytosanitary requirements for international transport, so plastic pallets are often chosen for exporting goods.

The major disadvantage of most plastic pallets is their higher cost (although some less durable, low-cost options are available). Irregularly sized plastic pallets are especially expensive because they require custom molds. Most companies that invest in durable plastic pallets plan to reuse them again and again and, therefore, must develop an effective pallet management system to make their investment worthwhile.

Metal

Metal pallets are available in aluminum and steel. Aluminum pallets are much lighter than steel pallets but usually cost more, too.

Like plastic, metal is more expensive but also more durable, uniform and sanitary than wood. Because of their strength, metal pallets are often used for exceptionally heavy loads. They are also used in high-temperature environments where other pallets would burn or melt.

Corrugated paperboard

According to White, corrugated pallets are often used in exporting goods because they're lightweight, they aren't subject to phytosanitary regulations and nearly every country in the world has a means of recycling them. Their weight makes them especially attractive for air freight.

An obvious disadvantage of paperboard pallets is their susceptibility to moisture. In addition, most aren't strong enough to hold heavy loads or to be stored in a pallet racking systems, says White. Constructing stronger paperboard pallets is possible, he says, but it adds significantly to the cost.

Specialized wood

While traditional wooden pallets are made of raw lumber, wood can be used in several other ways to make pallets.

A composite material made by mixing wood fibers with plastic, for example, can be molded to form pallets that look much like plastic pallets. Wood/plastic composites can also be extruded into boards and used to build a pallet that looks much like a traditional wood pallet.

Panel deck pallets—pallets with a flat top surface—are often made of wood-based composites or plywood. Because panel deck pallets are strong and consistent, says White, they work well with automated equipment. But they're expensive, he says, so they're primarily restricted to captive environments.

The pallet lifecycle

When a customer receives a pallet-load of goods from a supplier, what happens to the pallet?

In some instances, the receiver simply throws the pallet away along with the other packaging material. This practice, however, is becoming less common as companies seek to better use their resources, says Rick LeBlanc, president of PACTS Management (905-372-5928, www.pactsmgt.com) and co-author of “Pallets: A North American Perspective.”

Many pallet receivers have contracts with wooden pallet recyclers, he says. When a receiver has accumulated a sufficient number of wooden pallets, the recycler picks them up and refurbishes them for resale. Pallets that aren't fit for reuse can be broken down for scrap or mulched.

Some suppliers invest in durable pallets which they intend to reuse in a closed loop, and they make arrangements with their customers to return empty pallets.

Other manufacturers don't buy pallets at all, but rent pallets from companies such as CHEP and iGPS. They contract with their customers to return empty pallets to the rental company. The rental company then repairs the pallets as necessary and reissues them to other customers.

Other companies participate in pallet pools and send unneeded pallets to other pool members for reuse.

Pallet lingo

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Skid: a pallet that has no bottom boards (also known as a “single deck” pallet)

Non-reversible: a pallet that cannot be used when turned upside down, either because it has no bottom boards or has a limited number of bottom boards

Reversible: a pallet that has deck boards spaced identically on the top and bottom, permitting the pallet to be reversed

One-way: an expendable pallet made of low-quality materials intended to be shipped once and then disposed

Two-way: a pallet that permits forklift entry in the two opposite pallet ends only

Four-way: a pallet that permits forklift entry in all four sides

Eight-way: a pallet that permits forklift entry on all four sides as well as diagonally at each corner

Blue pallet: a pallet with its sides painted blue, indicating it's owned by the pallet rental company CHEP

Orange pallet: a pallet with its sides painted orange, indicating it's part of the Canadian Pallet Council pallet pool

White pallet: pallets not painted or otherwise marked to indicate their ownership

Pallet manufacturers

Learn which manufacturers produce the types of pallets you may need or use.

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Pallet Manufacturers

Company	Website	Telephone number
Wood		
<i>Most wooden pallet manufacturers and recyclers are regional companies. Check with the National Wooden Pallet and Container Assoc. for a listing of manufacturers in your area.</i>		
Plastic		
Allied Plastics	alliedplastic.com	262-877-4700
Buckhorn	buckhorninc.com	800-543-4454
CABKA	cabka.com	877-462-2252
Decade Products	decadeproducts.com	877-365-2887
Fabri-Form	fabri-form.com	800-837-2574
Flexcon Container	flexcontainer.com	973-467-3323
Formall	formall.com	800-643-3676
Georg Utz	georgutz.com	812-372-2790
Granville	granville.cc	800-350-4660
International Contract Molding	icmolding.com	800-399-6886
JenMar Manufacturing	jenmarmfg.com	866-351-5373
LINPAC Allibert	linpacallibert.com	+44 (0)1922 726060
Monoflo International	miworldwide.com	800-446-6693

Norseman Plastics	norsemanplastics.com	888-675-2878
ORBIS	orbiscorporation.com	800-890-7292
PDQ Plastics	pdqplastics.com	800-447-7141
PrimePal	primepal.net	316-263-1900
Rehrig Pacific	rehrigpacific.com	800-421-6244
Robinson Industries	robinsonind.com	989-465-6111
Schaefer Systems International	ssi.schaefer-us.com	704-944-4500
Schoeller Arca Systems	schoellerarcasystems.com	248-355-3000
SolPlast	solplastics.com	888-765-7527
Thermodynamics	okpallets.com	800-627-9037
Wilbert Plastic Services	wilbertplasticservices.com	866-273-1810

Metal

Atlas Material Handling	atlaswire.com	847-678-3450
Cargotainer	cargotainer.com	800-221-3794
Jarke	jarke.com	847-541-6500
LM Containers	lmcontainers.com	573-359-2286
Streator Dependable Mfg.	streatordependable.com	800-795-0551
Worthington Steelpac	worthingtonsteelpac.com	717-851-0333

In addition, many regional metal fabrication shops manufacture custom pallets.

Paperboard

CorrPallet	corrpalleteinc.com	281-998-9855
Corrugated Pallets	corrugatedpallets.com	800-760-0003
Corrupal	corrupal.com	888-856-2222
EcoDuro	ecoduro.com	888-330-6646
Farmers Corrugated Solutions	farmerscorrugatedsolutions.com	888-293-8930

In addition, many regional corrugated converting plants manufacture custom paperboard pallets.

Specialized wood

Litco International	litco.com	877-284-5043
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In addition, many regional lumber mills manufacturer specialized wood pallets. Check with the [Engineered Wood Assoc.](http://www.woodengineered.com) for a listing of manufacturers in your area.

Pallet rental services

CHEP	chep.com	407-370-2437
iGPS	igps.net	800-884-0225
Kamps	kampsinc.com	616-453-9676
Ongweoweh	ongweoweh.com	607-266-7070
PECO Pallet	pecopallet.com	877-227-7326

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