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HANDLING AND STORAGE OF GYPSUM PANEL PRODUCTS: A GUIDE FOR DISTRIBUTORS, RETAILERS, AND CONTRACTORS

This guide was developed by the Gypsum Association to assist distributors, lumber yards, home centers, drywall contractors and others who handle gypsum panel products. Understanding and following the recommendations in this guide will minimize damage to gypsum panel products during handling, shipment, and storage.

Those handling gypsum panel products shall follow industry work and safety rules, including procedures to protect the health and safety of everyone in the work area. Following proper handling techniques will reduce damage to property and equipment as well as to the gypsum panel product. Local, state and federal laws differing from the recommendations in this guide shall take precedence. The Gypsum Association and its member companies do not warrant or otherwise guarantee that following the procedures detailed in this guide will result in completely safe, effective, and satisfactory handling of gypsum panel products. The Gypsum Association and its member companies are not responsible for accidents or damage to property or individuals.

GENERAL INFORMATION REGARDING GYPSUM PANEL PRODUCTS

Gypsum panel products is the general name for a family of sheet products consisting essentially of a gypsum core. Gypsum board is manufactured with paper surfaces. Some gypsum panel products are fiber reinforced or manufactured with glass mat facers. Fiber reinforced gypsum panels are unfaced.

Gypsum panel products are flexible but will crack or break, if bent beyond their stress limits. The edges and ends of the panels are susceptible to damage when dropped, stacked on edge, or struck by objects.

Gypsum panel products must be stored in dry conditions. Gypsum panel products may sag or warp if they are exposed to high moisture, improperly supported, or stacked on edge while stored. Gypsum panel products are susceptible to mold growth if they are allowed to become wet and remain wet for an extended period of time.

Gypsum panel products shall bear the manufacturer's trademark or brand name, and applicable ASTM standard or other designation. Product identification markings may appear on the board surface, end bundling tape, or a separate sheet in bulk shipments.

The end tape of most gypsum panels is printed with a Universal Product Code (UPC). While actual placement of the UPC on the end tape is at the discretion of each manufacturer, one UPC bar code identifies only one piece of gypsum panel product in the bundle.

Standards

Gypsum panel products are defined by one of the following ASTM standards.

Gypsum Wallboard	ASTM C1396/C1396M
Gypsum Lath	ASTM C1396/C1396M
Gypsum Sheathing Board	ASTM C1396/C1396M
Gypsum Backing Board, Gypsum Coreboard, and Gypsum Shaftliner Board	ASTM C1396/C1396M
Gypsum Base for Veneer Plasters	ASTM C1396/C1396M
Water-Resistant Gypsum Backing Board	ASTM C1396/C1396M
Exterior Gypsum Soffit Board	ASTM C1396/C1396M
Predecorated Gypsum Board	ASTM C1396/C1396M
Gypsum Ceiling Board	ASTM C1396/C1396M
Fiber-Reinforced Gypsum Panels	ASTM C1278/C1278M
Glass Mat Gypsum Substrate for Use as Sheathing	ASTM C1177/C1177M
Glass Mat Water-Resistant Gypsum Backing Board	ASTM C1178/C1178M
Glass Mat Gypsum Panels	ASTM C1658/C1658M
Abuse Resistant Gypsum Panel Products	ASTM C1629/C1629M
Impact Resistant Gypsum Panel Products	ASTM C1629/C1629M
Factory Laminated Gypsum Panel Products	ASTM C1766

Employees of distributors and retailers shall become familiar with the various types of gypsum panel products so the correct product will be delivered to the customer.

HANDLING AND STORAGE

Special care is required when loading, securing shipments, warehousing, or otherwise handling gypsum panel products.

Safety Tips for Handling

Stacks of gypsum panel products are very heavy and can become unstable if proper stacking and handling procedures are not followed. Those handling panels shall use caution when stacking or working in the presence of stacked gypsum panel products. For example, a four ft (1220 mm) wide by 12 ft (3660 mm) long by 1/2 in. (12.7 mm) thick gypsum panel can weigh over 80 pounds (36 kg); this means a stack of 25 of these panels weighs over one ton (900 kg). Heavy equipment is frequently used to move, stack, load, stock, or otherwise handle gypsum panel products. Only trained, qualified, and properly certified drivers may operate this equipment. Suitable safety measures shall always be followed when operating or working around these machines.

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Procedures and techniques presented in this guide shall be followed by workers for safe and proper handling of gypsum panel products. Workers who are inexperienced in using any of the tools or equipment in the procedures described, or are uncertain about the safety of these procedures for a particular activity or undertaking, shall consult with someone who is skilled or certified. Seeking help from a more experienced worker or supervisor when uncertain about proper safety measures can safeguard against possible injury. Time, material, property, and equipment can also be preserved. Safe work practices can prevent harmful and costly accidents. Follow the safety tips below while handling gypsum panel products:

- Wear a dust mask when conditions warrant.
- Protect eyes with safety glasses or goggles when necessary.
- Use additional personal protective devices and clothing such as a hard hat, gloves, safety shoes, etc.
- Work in pairs whenever possible.
- Lift carefully with good techniques by using the legs, not the back.
- Proceed at a deliberate but steady pace.
- Stack gypsum panel products flat – not on edge or end.
- When placing gypsum panels on a stack, do not allow the panels to drop onto the stack from a vertical orientation. Place one edge of the gypsum panel on the stack and rotate the panel to a 30° or less angle before releasing the free edge to drop onto the stack.
- Gypsum panel products shall be stocked so their weight is evenly distributed and the floor is not overloaded.
- Ensure that all equipment is in good repair.
- Select and use the correct tool for each job.
- Take precautions and allow time to make sure the work is done safely.

Storage

Gypsum panel products shall be stored in a warehouse or other suitable structure where they will not be exposed to inclement weather or temperatures that exceed 125°F (52°C). Units of gypsum panel products shall always be stored flat and evenly supported on a firm, dry, level, and structurally sound floor. Stacking of gypsum panel products shall be limited to a maximum height of 17 feet (five m) assuming all recommendations in this document are followed.

Gypsum panel products shall not be stored in areas of excessive humidity nor shall they be stored beneath overhead equipment which may have a tendency to drip grease, oil, or water. Gypsum panel products shall not be stored in heavy traffic areas or where they can be damaged by lift trucks and other warehouse equipment, nor shall they be stored at aisle intersections. If panels must be stored at aisle intersections, corner protectors constructed of sheet metal or similar material shall be used.

The plastic covering provided for product protection during shipment on rail flatcars or flatbed trucks is not suitable for storage of gypsum panel products and shall be removed upon arrival at the destination and prior to warehouse storage. Failure to remove this plastic covering can result in damage to the gypsum panel products due to moisture, condensation, and/or mold.

Exposure of gypsum panel products to rain and other high moisture levels may result in water stains, discoloration, mold, paper delamination, and sag. This sensitivity of most gypsum panel products to moisture requires that gypsum panel products NOT be stored outdoors.

Support Risers

Units of gypsum panel products shall be supported properly to minimize sagging. Precautions shall be taken in placement of support members (known as risers, sleuters, strips, dunnage or spacers).

Figure 1 shows risers that are easily constructed from strips of gypsum panels. If units of gypsum panel products will be stored on a floor that may be subject to dampness, bottom risers shall be wood or plastic. All risers shall be of uniform height to ensure the gypsum panel products are supported evenly. The most common size of risers is three in. (76 mm) wide by three in. (76 mm) high by the width of the gypsum panel product or slightly less.

Environmental concerns regarding the reduction of solid waste to landfills make it increasingly difficult to dispose of worn-out gypsum risers. Distributors, retailers, and others who handle gypsum panel products may wish to use permanent risers of wood or plastic.

Where permanent storage locations are designated for different lengths and types of gypsum panel products, appropriate signs may be permanently posted. Additionally, the floor may be marked to indicate where each length and type of gypsum panel product is to be stored. Riser locations may be painted on the floor to show proper riser spacing for the length of gypsum panel product in each space.



Figure 1 – Typical Gypsum Risers

MINOR alterations in the location of risers are sometimes required to adapt to spacing of lift truck forks. If necessary, risers may be moved a few inches in either direction as long as the number of risers is not reduced, the maximum distance between risers is not exceeded and vertical riser alignment is maintained.

Preventing Sagging Gypsum Panel Products

One of the most common problems created by improper storage is sagging. Careful placement of risers as shown in Figure 2 will minimize this problem. Figure 3 shows how sagging occurs when risers are placed improperly. Storage under these conditions will cause permanent distortion of gypsum panel products, thereby rendering them unusable.

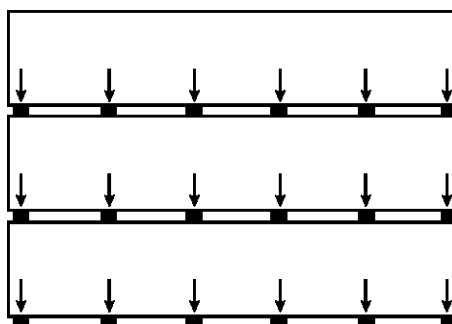


Figure 2 – Correct Riser Alignment

Note that risers are aligned vertically so that loads are transferred directly to the floor.

Preventing Sagging Gypsum Panel Products, cont.

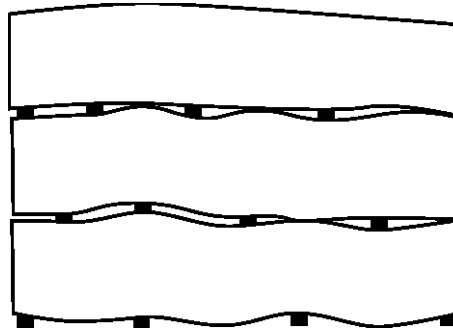


Figure 3 – Incorrect Riser Alignment

Note the sag resulting from misalignment of risers.

A good stock rotation plan and inventory control system is necessary to avoid sagging problems. If sagging does occur, the gypsum panel products may be straightened by the following method.

1. Restack the panels and move the risers about four to six inches closer together.
2. Add evenly spaced risers as necessary to ensure the entire stack is adequately supported.
3. Risers shall be vertically aligned. The sagging will be reduced within several days.

The horizontal distance between risers shall not exceed 28 in. edge-to-edge. For ¼" thick boards risers shall not exceed 8 in. edge-to-edge. Long-term storage requires additional risers. Gypsum panel products should not be stored in high humidity areas; however, if such storage conditions exist, additional risers shall be used

Manual Handling

Gypsum panel products shall be handled carefully and by two or more people. Gypsum panel products shall be delivered to the job site as close to the time they will be used as possible. Panels shall be carried - not dragged. When panels are moved manually, the panels shall be supported vertically by the edges and never carried flat.

Mechanical Handling

Because of the bulky and heavy nature of gypsum panel products, they are generally handled mechanically in warehouses, staging areas, storage, etc. Lift trucks are typically used to move units of gypsum panel products. Boom trucks are normally used to deliver gypsum panel products.

Lift truck drivers shall be trained and licensed to operate lift trucks in accordance with regulatory requirements.

Lift trucks with appropriate weight capacity ratings shall be used to move units of gypsum panels. A lift truck with a minimum 15000 lb (6800 kg) capacity is preferred for handling gypsum panel products.

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Special forks are available to minimize damage caused by a fork that contacts the bottom sheet of a unit of gypsum panel products. These forks feature rounded or beveled edges and a slightly exaggerated taper to the tip of the fork. Cushioning material applied to the load-face of the forks will minimize damage to the edge of the panels. Non-marking rubber or polyethylene backing pads installed on the load face of the forks are recommended to absorb the impact between the load face and the load. Padding on boom forks and stocking carts should be inspected and replaced when worn or ineffective. Side shifting forks may be less likely to damage units of panels.

Fork spacing shall be adequate for the length of panel product being carried. If only one length of gypsum panel product is handled, lift trucks with nonadjustable forks may be suitable. However, for maximum flexibility in handling gypsum panel products of varying lengths, forks shall be mounted on carriages which permit operators to adjust the distance between forks. Fork spacing shall be such that a maximum of four feet of panel extends beyond the forks on either end. A carriage spread in the range of 46 to 84 inches (1170 – 2130 mm) is suitable for carrying the most common lengths of gypsum panel products.

Caution shall be exercised by the lift truck operator when moving units of gypsum panel products. Even with padded load faces, impact between a moving lift truck and a unit of gypsum panel product may damage the edges or ends of the panels. Operators shall avoid bumping the stacks.

Units of gypsum panel products shall not be divided by lift truck forks without the use of wedge blocks. These wedge-shaped blocks of wood or plastic shall be used to separate units of gypsum panel products to minimize any damage to the panels.

Gypsum panel products shall always be handled so the forks never come in contact with the finished surface (face) of the panels. Forks contacting the face of gypsum panel products can damage the face.

End-strapping minimizes excessive flexing, cracking, or breaking of long lengths of gypsum panel products. End-strapping shall not be removed until the panels are placed at the work site or are ready for stocking manually.

Use of Wedges

Fork lift operators can load orders alone if necessary by using a wooden or plastic wedge as shown in Figure 4. Two or three persons may be needed to stage, load, and fill orders if wedges are not used. When wedges are used risers may be omitted between units of stacked gypsum panel products. Stacking is simplified and less waste is generated when risers are not used.

The typical plastic wedge is 24 in. (600 mm) long by eight in. (200 mm) wide with a three in. (75 mm) thick butt and is used in the same manner as the wooden wedge. Plastic wedges may be preferable because of their low cost and light weight and generally last longer.

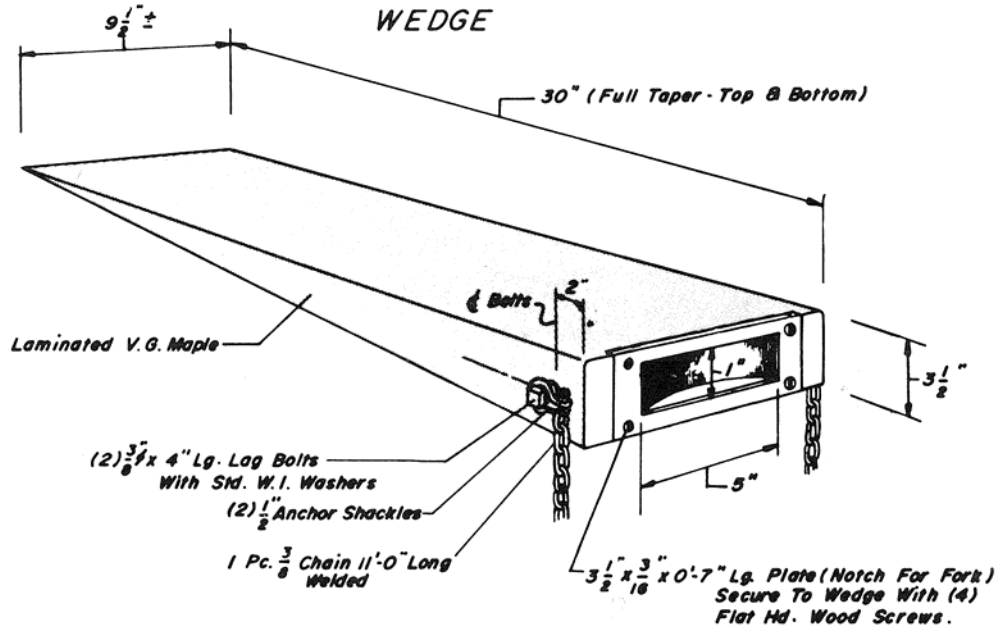


Figure 5 – Typical Wedge Block

A concave metal cap may be attached to the butt end of the wedges in order to prolong their life and for easier insertion of the fork into the wedge. To facilitate easier removal of the wedge when gypsum panel products are stacked without risers, a hole may be drilled through the side of the wedge near the butt for attachment of a rope handle.

Paste wax applied to the wedge will provide a slippery surface for easier insertion. Care shall be taken to prevent damage to the thin tip of the wedge. If damaged, the tip shall be ground to a smooth edge.

Stocking Gypsum Panel Products on Job Sites

Gypsum panel products are heavy, and come in a variety of lengths, thicknesses and types. Be sure the unloading supervisor makes personnel aware of all safety precautions, and that they are followed. Delivery of a large quantity of gypsum panel products to a job site requires special equipment, such as a boom truck specifically designed to expedite the unloading process. Only trained and qualified operators shall operate the boom during the off-loading process. The operator shall ensure the boom does not come in contact with electrical or other utility lines or otherwise inflict damage in the area.

Regular flat-bed trucks with hydraulic lift-arms are frequently used to stock smaller jobs, such as residential structures. Drivers of such delivery trucks, especially in residential areas, shall ensure that property, such as septic systems, lawns and landscaping is not damaged. Damage to property may also result in damage to the truck and incur expenses for the distributor/retailer. Drivers shall always survey the unloading area to be sure it is safe to drive onto and use mechanical unloading devices.

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The following guidelines shall be followed when stocking gypsum panel products on job sites:

- Gypsum panel products shall be delivered just prior to installation time if possible to minimize potential damage associated with long term jobsite storage.
- Gypsum panel products delivered to a job site shall be placed under cover immediately to protect from rain, snow, or other high moisture conditions. The cover shall be installed to allow air flow to prevent moisture build-up and associated mold growth while maintaining protection of the gypsum panels.

Construction sites can be dangerous places. The safest way to store gypsum panel products on a jobsite is to stack them flat on risers placed on a solid surface. Storing gypsum panel products on edge leaning against wall framing can pose a serious hazard. Panels stacked on edge can easily become unstable, and the entire stack can topple or slip, causing serious injury or even death.

- Gypsum panel products delivered to a job site shall be separated by:
 - Type (Place the type of panel product near areas where it will be installed, e.g., type X, regular, moisture-resistant, etc. This placement reduces the chance that the wrong type of panel product will be installed. In addition applicators/hangers will have easy access to the stocked gypsum panel products.)
 - Size (Do not place longer-length panel products on top of shorter lengths.)
- Gypsum panel products shall be stocked out of the way of construction traffic.
- Special care shall be taken to ensure that the gypsum panel products do not damage the exposed studs, windows, door frames, etc.
- Gypsum panel products shall not be stocked in areas of intense work activity by electricians, plumbers, or other trades.
- Gypsum panel products stocked on a job site are not to have materials stored or stacked on top of them.
- Gypsum panel products shall be stocked so their weight is evenly distributed and the floor is not overloaded.
- Gypsum panel products shall not be stacked high enough to pose a danger from toppling.
- Gypsum panel products stocked in unenclosed buildings shall be placed far enough inside to prevent exposure to inclement weather, such as blowing rain or snow.
- Special care is necessary when stocking upper floors of open buildings during periods of high winds.

LOADING GYPSUM PANEL PRODUCTS

When gypsum panel products are shipped by rail cars and trucks, the following loading procedures described below shall be followed.

Open Top Rail Flatcars

Distributors or reloaders may have occasion to load gypsum panel products onto rail cars. All rail cars shall be thoroughly inspected by the shipper for defects before loading. Special attention shall be given to the alignment of bulkheads, the condition of floors, and the soundness of bulkhead welds. If the bulkhead is broken at the base or out of plumb, the car shall be rejected. Minor misalignment may be corrected by nailing gypsum panel product dunnage to the bulkhead. Such dunnage shall not exceed 24 in. (600 mm) in width.

Floor and bulkhead surfaces shall be structurally sound and free from holes. If the floor is in disrepair, the car shall be returned to the carrier for repairs.

Strict rules governing the loading of gypsum panel products on rail cars are published by the railroads. Failure of a shipper to comply with the rules may result in forfeiture of all claim rights in case of damage. Additionally, legal liability issues may arise for the shipper.

The Association of American Railroads (AAR) updates its rail loading rules annually. It is the shipper's responsibility to conform to the most current rules. Copies of the rules are available from AAR, 425 3rd Street, S.W., Washington, DC, 20024; 202-639-2100; <http://www.aar.org>.

Railroads do not accept liability for damage due to moisture. Care must be taken to adequately cover loads on flatcars. Sheathing paper may be used atop loads beneath a one-piece polyethylene or similar covering material. End caps shall be applied carefully. All tears or other damage shall be repaired.

Flatbed Trucks

Each state and province, as well as the U. S. Department of Transportation (DOT) for interstate commerce, has well-defined laws, rules, and regulations regarding transport by truck. Equipment and personnel shall meet all applicable regulations.

The motor carrier, or driver, is responsible for the quality and safety of tie-downs used to secure the load. A variety of tie-down types are available, such as polyester webbing, steel strapping, and rope. Webbing may be preferable because it is unaffected by moisture, normally does not stain, and provides uniform tension each time a load is secured. The tie-downs shall be located as close as possible over the vertical risers in the gypsum panel product units. Corner protectors shall be used to prevent damage to the top pieces of gypsum panel products.

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The cover used over loads of gypsum panel products on flatbed trucks or trailers shall be completely waterproof, weathertight and free of rips and tears. If two-piece fitted covers are used, the front cover shall overlap the rear section by a minimum of two feet to avoid leaks during transit.

Drivers shall stop periodically to inspect the condition of the load and tie-downs.

All drivers handling gypsum panel products shall be instructed in proper handling and delivery techniques. The following guidelines can be used by distributors or retailers in their driver training

Guidelines for Carriers, Drivers and Trailer Loading Personnel

Before loading a truck or trailer, check to ensure it is clean and free of any objects that might damage the gypsum panel products. Floors shall be in good condition to keep materials dry and free from damage due to wet roads.

When loading trucks forklift operators should **never** stand between the load on the forks and the truck bed to set the risers. The forklift should be parked parallel to the truck bed with the loaded forks flat on the ground and lift turned off with the parking brake set before setting risers on the truck bed.

- Ensure the load will ride securely and safely and all regulatory requirements are observed.
- Check the load quantity before leaving the distribution center or yard; the driver is responsible for any shortage or damage.
- Check the condition of the cover to ensure the load will be adequately protected. (The load cover shall completely cover the load to the vehicle's floor.)
- Be sure the load is securely anchored to the trailer to prevent loss or damage in transit. Make periodic inspections of the load while en route to the destination.
- Make a notation on all copies of the billing of the exact nature and extent of any shortage or damage. Sign notation as driver. Be sure customer signs all copies. Material shall not be returned to the distribution center or yard without prior approval.
- Monitor the unloading since material damaged by customer during unloading is the customer's responsibility. Do not accept such material for return. Only indicate such damage on billing copies or delivery receipt if that is the policy of customers receiving the materials. Be prepared to make a separate report of this damage to the receiving office if that is the customer policy. Do not accept material from previous shipment(s) for return unless driver's supervisor gives authorization.

Gypsum panel products require special handling because of the potential for damage to the material and safety considerations for workers.

NOTES:

GYPSUM ASSOCIATION MEMBERS 2017

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CONTINENTAL BUILDING PRODUCTS OPERATING COMPANY, LLC
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