

Safety Considerations, Material Handling



This chapter is an overview of the health and safety concerns that should be addressed when USG's products and systems are used at home in do-it-yourself projects or at professional construction sites. The chapter is not intended to be a comprehensive review but instead outlines some major issues, and refers to other sources for information and assistance. No attempt is made at completeness. We recommend that contractors seek the assistance of safety professionals, especially at the professional construction site, because there are many factors to be considered that are not included here.

Introduction

Construction can be a dangerous activity. This is intuitive to many people but it is also borne out by government statistics which show construction to be one of the occupations most likely to result in severe injury or death. The risks are present for "do-it-yourselfers" working around the home as well as for construction professionals.

The key to safety is training. Training leads to familiarity with the hazards and how to avoid them, and is the foundation of any safety program. For people involved in professional construction, guidance is provided by federal OSHA regulations and comparable state laws and regulations. As stated above, the assistance of a safety professional is invaluable. The construction industry, like most others, long ago passed the point where so-called common sense is sufficient by itself to avoid hazards. Instead, today's safety program requires knowledge of many technical issues that are not commonly understood.

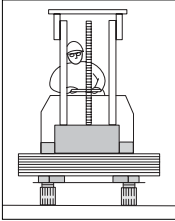
For the "do-it-yourselfer" who works around the home, the best approach is to familiarize yourself with all the information available. Sources of information include Material Safety Data Sheets (MSDS) and product warnings. Also, literature produced by the Gypsum Association and guides issued by state and federal agencies can be helpful.

Safety risks can be caused by both physical dangers and health hazards. Physical hazards include, for example, heavy objects falling, panels breaking and electrical hazards. Health hazards are often less obvious and include, for example, the long term harm to the lungs and other organs caused by exposure to crystalline silica and mold, fungus and mildew that can grow on building materials after they get wet. Most people have little or no intuitive sense for what situations pose health hazards. Some of these hazards may be immediate and some may have a delayed effect. In addition, hazardous health effects can occur from a single exposure or as a result of long-term exposure. Thus, this part of safety awareness depends heavily on education. Warning labels and MSDSs are the primary initial sources of health hazard information.

Handling Wallboard and Other Panel Products

SHEETROCK Brand Gypsum Panels, IMPERIAL Brand Gypsum Base, DUROCK Brand Cement Board and FIBEROCK Brand Gypsum Panels are all heavy panels whose handling by machine or by hand poses the risk of serious injury.

A. Forklift Safety



Board products and ceiling tile will first be moved by a forklift or similar device. It is absolutely essential that the equipment be rated capable of handling the loads. The forks should always be long enough to extend completely through the width of the load. Forks should also be extended far enough apart to support the load so that it will not break or fall. Gypsum panels are brittle compared to other building products, such as lumber. If not properly supported, individual panels or a whole lift can break.

SHEETROCK Brand Gypsum Panels and IMPERIAL Brand Gypsum Base:

- Fork spacing between supports should be one-half the length of the panels or base being handled so that a maximum of 4' extends beyond the supports on either end.

FIBEROCK Brand Gypsum Panels:

- Fork spacing should be similar to the above except that a maximum of only 3' should extend beyond the supports on either end.

Fork carriage spread in the range of 46" to 84" is suitable for handling most common lengths of board and panels.

Sometimes gypsum board manufacturers offer to band lifts of board at each end. This will aid in preventing deflection of the board when it is picked up with a forklift but it is not a substitute for proper fork spacing. Banding will not prevent board from breaking if the forks are not spaced far enough apart.

Other key items of forklift safety include:

- Always follow the forklift manufacturer's operating and maintenance instructions, especially concerning the load limits of the forklift.
- Always wear the safety belt when operating a forklift;
- Never move the forklift with the load elevated more than a few inches above the floor or ground surface;
- Never stand below or near a raised load;
- Observe all traffic rules in the loading or warehouse area;
- Never disable equipment back-up alarms or other safety devices;
- In heavy traffic areas, use a spotter to regulate forklift, pedestrian and other traffic.

For more information on forklift safety, see:

OSHA CFR, (800) 321-OSHA (6742)
National Safety Council, (800) 621-7619

B. Stacking Board

Gypsum Association literature states unequivocally that board should be stacked flat because stacking boards vertically against a wall poses a safety hazard. See "Handling Gypsum Board," Gypsum Association publication GA-801-93:

"Stacks of gypsum board are very heavy and can become unstable if proper stacking and handling procedures are not followed. Workers must always be extremely careful when stacking or working in an area where gypsum board is stacked. A 4' wide by 12' long by one-half-inch thick gypsum board can weigh over 80 pounds; this means a stack of only 25 boards weighs over a ton." (Page 2)

"Gypsum board should always be stored flat. Placing it vertically on edge for an extended period may damage the edges and can also cause the board to warp. Additionally, board stacked on edge can easily become unstable and accidentally fall over. Stacking gypsum board flat will lower the potential for a safety hazard." (Page 9)

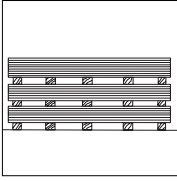
However, there are some situations where stacking the board flat creates different safety hazards. For example, in residential construction where rooms are small and hallways narrow, contractors prefer that the board be stacked vertically against the wall so that tradespeople have room to move around. In these circumstances, board stacked flat could pose a tripping hazard.

Also in residential construction, floor load limits often are not sufficiently high to be able to accommodate a concentrated point load of gypsum panels, cement board or gypsum fiber panels in the center of the floor; instead, the safer procedure in this situation is to distribute the board in vertical stacks around the sides of the room. Sometimes, when different sizes or widths of board are required (for example, 5/8" for the ceiling and 1/2" for the walls) vertical stacking makes it easier for the wallboard hangers to find the board they need.

For all these reasons, in many if not most parts of the country, contractors prefer that the board be stacked vertically. When this is done, be sure to leave at least 4" to 6" of space between the bottom of the first board in the stack and the wall. Leaving less than 4" creates a risk that the stack could be pulled over; leaving more than 6" applies too much weight laterally against the wall.

C. Storage Conditions

Protecting wallboard and other products from rain, snow, sunlight and wind is important. Not only can the weather damage the board by soaking it, but exposure to weather can do other harm not immediately obvious. For example, moisture could affect the bond of the face paper to the gypsum core in a way that later creates problems in application and finishing. Also, ultraviolet (UV) exposure from sunlight will ruin the ability of plaster base panels (blue board) to act as a substrate for some veneer plasters.



Generally, it is safer to stack board flat.

More insidious, if wallboard is left unprotected and then installed, moisture in the wallboard can provide conditions favorable for mold, mildew and fungus growth which, as discussed below, poses not only esthetic problems, but also serious health consequences.

Although board products are very heavy, high winds across the flat surfaces of the board can provide “lift” just as with an airplane wing, and thus wind can send heavy pieces of gypsum wallboard flying through the air causing damage and serious injuries.

For more information see:

Handling Gypsum Board
Gypsum Association publication GA-801-93
Tel: (202) 289-5440

D. Lifting

SHEETROCK Brand Gypsum Panels, IMPERIAL Brand Gypsum Base, DUROCK Brand Cement Board, FIBEROCK Brand Gypsum Panels, joint compound packages (buckets or boxes), bags of plaster and ceiling tile packages are all very heavy, awkward loads posing the risk of severe back injury. Proper lifting techniques should always be observed: Keep the load close to your body and use your legs, not your arms, to lift. Use mechanical assistance such as pallet lifters or hand dollies wherever possible. Manual lifting and carrying should be confined to the shortest distance possible.

For more information see:

National Safety Council, (800) 621-7619

Other Physical Hazards

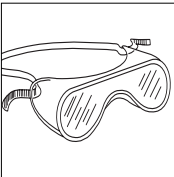
Pallets

Almost all pallets used to transport joint compound, plaster, plaster bags, ceiling tile, cement board and other construction materials are made of wood. Any pallets that are defective or incomplete (missing pieces) should be carefully unloaded and discarded from service. Not only will a broken pallet cause a spill and loss of the product, but it could also lead to serious injuries or death if heavy materials drop on people.

For more information see:

National Wooden Pallet and Container Association, (703) 527-7667

Eye Protection



Safety glasses or goggles protect eyes from a variety of hazards.

Eye protection should be worn at all times, not just when using power equipment. Some products, such as plasters containing lime, pose the risk of a chemical burn of the eye which could result in the loss of sight. However, even without a chemical burn, the mere physical impact of a trowel full of plaster dropped on the eye can cause severe injury or blindness. Eye protection (safety glasses or goggles) also protects the eyes from dust.

For more information, see:

National Safety Council, (800) 621-7619

Five-Gallon Bucket Child Drowning Warning

⚠ WARNING ⚠ ADVERTENCIA



Children can fall into bucket and drown.

Keep children away from bucket with open a small amount of liquid.

Los niños pueden caerse en el balde y ahogarse.

Mantenga a los niños alejados del balde, aunque el contenido sólo sea una pequeña cantidad de líquido.

In the mid-1980's health officials noticed a pattern in some drowning deaths of very young children (less than three years of age). Several hundred deaths were reported of children drowning after falling into five-gallon buckets that were being used for household purposes (cleaning, storage, etc.). Some children drowned in as little as a few inches of liquid. Investigation showed that while children this age were developed enough to stand up and lean over into the bucket, their muscles were not strong enough to pull them out of the bucket. Also, because their heads were still large compared to the rest of the body, when they fell in, they could not get out. USG led the industry in putting a warning of this hazard on its five-gallon pails. It is a good example of a simple physical hazard that is not obvious. Many parents who would not dream of leaving their small children alone in a bathtub or by a pool might not recognize that a five-gallon bucket with a few inches of water also poses a drowning hazard.

Plaster Burn Warning

Occasionally people will use gypsum plaster in an art class or at home to make an imprint of a hand or other parts of the body. Sometimes, instead of an imprint, they will try to make a cast of the whole hand or other body part, completely enclosing it. This can lead to a serious injury because, as the plaster sets, it traps the hand or other body part, and enough heat is given off in the setting of the plaster to cause serious burns. For many years USG has placed the following warning on plaster products to alert users to this danger:

⚠ WARNING!

When mixed with water, this material hardens and becomes very hot—sometimes quickly. DO NOT attempt to make a cast enclosing any part of the body using this material. Failure to follow these instructions can cause severe burns that may require surgical removal of affected tissue or amputation of limb. This material is strongly alkaline and contact with dust or when wetted can cause burns or irritation to the skin, eyes, nose, throat or upper respiratory system. Avoid eye and skin contact or inhalation of dust. If dusty, wear an NIOSH/MSHA-approved dust respirator. Prolonged and repeated exposure to respirable crystalline silica may cause lung cancer. Use proper ventilation to reduce dust exposure. Wear eye and skin protection. If eye contact occurs, immediately flush thoroughly with water for 15 minutes. Get medical attention. If skin contact occurs, wash thoroughly with water. Do not ingest. If ingested, call physician immediately. Product safety information: (800) 507-8899.

Northak Special Veneer Plaster provides a white, smooth finish. Flat or texture finish ready for decoration. The finish may be left unadorned or skip-brush, fluted or other textured finishes are utilized and the finish is acceptable.

Ingredients
Plaster of Paris CAS 25499-40-0; crystalline silica (quartz) CAS 14808-06-7; calcium sulfate CAS 7778-18-9; and hydrated lime CAS 39455-23-3.

⚠ WARNING
When mixed with water, this material hardens and then slowly becomes hot—sometimes quickly. DO NOT attempt to make a cast enclosing any part of the body using this material. Failure to follow these instructions can cause severe burns that may require surgical removal of affected tissue or amputation of limb. This material is strongly alkaline and contact with dust or when wetted can cause burns or irritation to the skin, eyes, nose, throat or upper respiratory system. Avoid eye and skin contact or inhalation of dust. If dusty, wear an NIOSH/MSHA-approved dust respirator. Prolonged and repeated exposure to respirable crystalline silica may cause lung cancer. Use proper ventilation to reduce dust exposure. Wear eye and skin protection. If eye contact occurs, immediately flush thoroughly with water for 15 minutes. Get medical attention. If skin contact occurs, wash thoroughly with water. Do not ingest. If ingested, call physician immediately. Product safety information: (800) 507-8899.

KEEP OUT OF REACH OF CHILDREN.

Notice
We shall not be liable for accidental and consequential damage, directly or indirectly, occasioned, nor for any loss caused by application of these goods not in accordance with current printed instructions or any other than the intended use. Our liability is expressly limited to replacement of defective goods. Any claim must be submitted immediately in writing to us and within (30) days from date of sale or reasonably should have been discovered.

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Directions

Protect from moisture during storage and on the job.

In cold weather, heat the interior of the building to minimum of 50° F (10° C) to an adequate point before the application of plaster, while broadcast and finish is being applied and until the finish is dry. Air circulation should be kept at a minimum level during the process.

Mixing

Use a cage type paddle mixer (see PM10, "Mixing Equipment for Veneer Plaster") driven by a three-duty drill capable of producing 900-1000 rpm maximum under no load. Place approximately 1 to 1 1/2 cts. (8.5-15.1 L) of clean water in a 12- to 15-gallon, smooth-walled container, and with mixer operating, slowly add one bag of plaster. Mix for a minimum of five minutes, but not longer than five minutes, to disperse all lumps completely. Keep mixing equipment and all tools clean.

This finish will set in about one hour. Do not mix more material than can be used in 30 minutes. Do not retemper.

Use and Application

Where Northak Special Veneer Plaster is applied directly to masonry plaster base, first register all joints and interior angles (see PM12, "Registers," "Beard Tapes," and "FMC," "Veneer Plaster Joint Reinforcement Systems"). Particular joint reinforcement procedures vary with finishing methods and drying conditions.

Fill all voids and imperfections. Finish trowel after surface has become firm, holding trowel flat and using water sparingly. Do not overwet.

Best results are obtained by planning the plastering to permit continuous application from angle to angle. Where opening is unavoidable, use the plaster to terminate joint plaster in sharp clean edge—do not feather out. Bring adjacent plaster up to termination edge and leave level. Do not overlap. During finish troweling, use excess material to fill and bridge joints.

This material also can be used for the popular skip-trowel finish. Once the finish has become sufficiently firm, but before setting, locate with material from the same batch, but do not final trowel. Other types of texture surfaces can be achieved, but may require using additional aggregate. For sand finish finish, add up to 15 lbs. (6.8 kg) of light clean silica sand per 50 lb. bag of Northak Special Veneer Plaster to achieve the desired texture. The use of more than 15 lb. of sand per bag will decrease the hardness of the surface. Apply plaster in the normal manner but omit final troweling.

Start initial float finishing as soon as the material has become firm enough to permit removal of broom marks, wads and otherblemishes. Final float finishing must be accomplished prior to set, using water sparingly to avoid staining problems.

For heavier textures, apply sufficient material from the same batch using a trowel, sponge or other accepted method.

Inappropriate Use of Plasters, Joint Compounds or Other Products

People sometimes use construction materials in situations for which they are not designed, which can cause serious risks of injury or death.

For example, a gypsum plaster should not be used to anchor porch, stadium or balcony railings where the plaster is exposed to the weather. This is an extremely dangerous misuse of gypsum plaster. Rain and snow weakens and dissolves exposed gypsum plaster. The resulting railing failure can cause death or at the very least, serious injury to people falling from the balcony, e.g., or to people on the ground below. In another example of misuse, a person using gypsum plaster as a substitute for the dietary calcium supplement prescribed by a physician can bring about serious medical problems. No gypsum-based construction product is designed for human consumption.

Health Hazards

Perhaps the greatest change in safety programs for the construction industry in the past several decades is the still-growing appreciation of the hazards posed by various chemicals or substances once used or still used in construction materials. These include, for example, asbestos, lead and silica. Note that **no** USG products currently contain any asbestos or lead.

Silica

Crystalline silica quartz which gets into the deep lung (i.e., is respirable) can pose a long-term health risk, including cancer and other severe and debilitating diseases. All dust should be avoided, not just silica-containing dust. Excessive dust strains the lungs and overcomes the body's defense systems. Every step should be taken to avoid the generation of dust. Any dust that is generated should be kept away from people on the job site. All of the following strategies should be pursued to minimize dust exposure:

- Avoid dust generation with power tools. Wherever a product can be scored and snapped as is the case with all of our gypsum panel products, this method should be used rather than power tools to trim the board.
- Where power tools are used, dust-control mechanisms should be employed. Even consumer power tools come with dust control kits, some of which hook up to shop vacs.
- Similarly, when mixing plaster or joint compound in powder form, care should be taken to create as little dust as possible when emptying the bags into the mixer. Ventilation should always be provided or, better yet, provide a local exhaust for the dust.
- Final finishing of joint compound may create excessive dust if the worker or “do-it-yourselfer” is not properly trained to apply joint compound. For years USG and other manufacturers in the industry have recommended wet sanding to reduce or eliminate dust levels. More recently, several equipment manufacturers have offered sanding equipment that uses a combination of wetting and/or local exhaust to remove the dust as it is being created.

Mold, Mildew, and Fungus

Mold, mildew, and fungus are all microorganisms which can, under the right conditions, find a suitable environment in which to grow and survive on building materials. Most often this growth is caused by moisture leaking into the building, although condensation, temperature, pH, lack of exposure to sunlight and several other factors also are involved.

In the past, mold and mildew were considered primarily as an esthetic problem which spoiled the appearance of the walls or ceilings and only secondarily as a mild health hazard affecting people with allergies or asthma. Today, the picture has dramatically changed and medical science recognizes that not only can these microorganisms cause potentially severe health problems in people with asthma or allergies, but they also can sometimes pose serious health threats even to people who do not have these conditions. A well-known example is the bacteria that causes the so-called "Legionnaires Disease." Others less well known, but receiving increasing attention in recent years, are organisms such as *Stachybotris atra*, a fungal pathogen which can grow on wallboard and many other materials in the presence of moisture.

The best way to address mold, mildew and fungus is to make sure that building materials do not get wet before installation and are not exposed to moisture inside the finished building. Traditional building practices, such as management of water away from the interior of the structure, not only constitutes the foundation of good construction practice, but also is the best way to avoid the growth of mold, mildew and fungus. Remove any building products suspected of becoming wet and having mold on them from the jobsite.

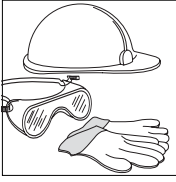
Fungicides and Mildewcides

Joint compounds are treated at the factory with fungicides to prevent mold growth in the bucket before the product is used, and to retard the growth of mold and mildew after the product is applied on walls and ceilings. The kinds and formulations of the fungicides and mildewcides have changed over the years. For example, decades ago joint compounds contained mercury-based biocides. These were discontinued by most manufacturers as the health hazards of mercury became better known. Today, USG generally uses tributyl tin benzoate as a mildewcide. However, the quantity of mildewcide or fungicide used in our joint compounds is minute and less than ever before. The amount used is less than 0.1 weight-percent, a quantity less than the reporting requirements of OSHA's Hazard Communication Standard.

Also, there are people who have special conditions (allergies, asthma, etc.) who will react differently and more strongly and adversely than the general population to these mildewcides and fungicides.

For further information, see the websites for EPA's Indoor Air Quality Home Page, American Lung Association Home Page and Canada's Indoor Environmental Program; they are listed at the end of this chapter.

Safety Tips for Installing Ceilings



Safety helmets, safety goggles/glasses and gloves are just three examples of safety equipment for use when installing acoustical ceilings.

When you arrive on the job, bring your safety helmet and cup-type eye goggles with you. Wear eye goggles whenever there is the possibility of eye injury, i.e., when using power-actuated tools, when doing overhead drilling, or when you hammer or drill into concrete.

Wear rubber soled shoes for good traction. Do not wear baggy or torn pants or shirts because these may catch on objects or moving equipment parts and cause injuries (e.g., falls).

Use a kit or tool belt to carry tools. Be very careful when using sharp tools or materials. If you are cut, obtain proper First Aid to avoid infection. If the injury is serious, seek professional help immediately.

Practice good housekeeping: keep work areas free of debris and neatly stack construction materials and panels. Secure these if necessary to prevent falling or sliding.

Personal protective equipment must be used to guard against the hazards of falling, flying or splashing objects, or exposure to harmful dusts, mists, fumes, vapors or gases. If respiratory protection is required, you must be medically certified that you are fit to wear a respirator and you must be properly fitted with the respirator.

Electrical Tools and Cables

Know how to properly use and maintain the power tools used for ceiling installations. Power-operated hand tools should be double insulated or grounded. Defective tools must be successfully repaired before use. Do not use electrical tools in wet conditions (e.g., wet floors). Do not hoist or lower a power tool by its electrical cord.

All cable in the work area must be covered or elevated to prevent damage. Frayed or worn electric cable must never be used. Extension cords must be protected against damage from traffic, sharp corners and projections. Flexible cord must be in continuous lengths without splices. When properly made, molded or vulcanized splices may be used.

When tools are equipped with guards, these must never be removed. The tools must be used with guards operating as they were designed to operate. Belts, gears, shafts or other moving parts must be guarded if there is any possibility that you can be exposed to the moving parts.

Power-Actuated Tools (e.g., Powder Fastening Tool)

These tools should be used only by persons who are properly trained and certified to use them. Powder-actuated tools must be oiled, cleaned and tested each day to make certain that safety devices are working properly. Other tips are as follows:

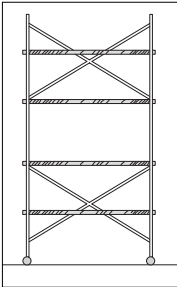
- Loaded tools must not be left unattended.
- Never point powder-actuated tools at anyone at any time.
- Always wear protective eyewear (goggles) when using these tools.
- Never use these tools in an explosive atmosphere.
- Use only cartridges and fasteners that are supplied by the manufacturer of these tools.

- Use these tools only in concrete, steel, mortar or masonry blocks. Use a small guard (“spall pad”) when shooting directly into masonry materials to prevent a pin or material from flying free.
- Do not use these tools on wood, plaster, gypsum panels or similar materials unless such materials are backed by concrete, steel, mortar or masonry blocks. Consult with general contractor before using these tools. Some pre-stressed concrete joists have tension rods placed near the bottom of the concrete, and the architect may not permit the use of powder-actuated hangers.
- If the tool misfires, wait at least thirty (30) seconds before removing the tool from the work surface.

Saber and Band Saws

Get proper training on how to use these tools before operating them. Always wear safety goggles when operating saws. Do not wear loose clothing that could get caught in the moving blade.

Scaffolding



- The height of a scaffold must not exceed four times the minimum base dimension.
- Footings for a scaffold must be rigid and capable of supporting the maximum intended load without settling.
- Do not use barrels, boxes, bricks, concrete blocks or other unstable objects to support scaffolds.
- Casters on wheels must be locked to prevent movement.
- Use cross or diagonal bracing or both to properly brace scaffolds. Scaffolding must be upright, rigid and square. Make certain that poles, legs or uprights are plumb and securely braced to prevent displacement or swaying.
- Scaffolds with platforms 10' or more above the ground must have guardrails and toeboards installed on all open sides and ends.
- Scaffolds 4' to 10' high (“Baker” scaffolds) and with a minimum horizontal dimension of less than 45" must have guardrails installed on all open sides and ends of their platforms.
- When scaffolding is used as a passageway or work is to be performed under the scaffold, a screen (No. 18 gauge U.S. Standard wire 1/2" mesh or equivalent) must be provided between the toeboard and guardrail and must extend the entire length of the opening.
- Scaffold planking must overlap a minimum of 12" or be secured from movement.
- Planks must extend over end supports not less than 6" and not more than 12".
- An access ladder or equivalent safe access must be provided.
- Weak or damaged scaffolding parts or components (braces, brackets, ladders, etc.) must be immediately fixed or replaced.

Portable Scaffolds

Portable scaffolds must be leveled and checked for safety each time they are moved. Do not adjust leg screws more than 12". Move scaffolds only when the floor is level and free of obstructions. No one should ride on a scaffold that is being moved.

Ladders

Ladders with broken or missing rungs or steps, broken side rails or other defects must not be used at the jobsite.

- Do not use ladders as horizontal platforms, runways or scaffolds.
- Keep ladders out of doorways, driveways and passageways.
- Do not use metal ladders for electrical work or in areas where they may contact electrical conductors.
- Set a ladder such that its base stands 1' of horizontal distance from the wall for every 4' of ladder height. The base of the ladder must be level and stable.
- The top of the ladder side rails must extend at least 36" above a landing.
- The area around the top and bottom of a ladder must be kept clear.
- When using a ladder hold the side rails with both hands when climbing up or down. Carry tools in a kit or on a tool belt when climbing a ladder.
- The feet of portable ladders must be placed on a substantial base (e.g., floor) before being used. Portable ladders must be secured at the top to prevent movement.

Additional Sources of Safety Information

Safety information is easier to find than ever before. OSHA and the comparable state agencies have done a tremendous amount of work in creating and making available materials that describe the hazards and how to prevent them in clear simple ways. Most of this material is also available on the Internet. Trade associations such as the Gypsum Association also make their materials available to the people who use Association members' products.

Organizations referenced throughout this chapter as sources for safety information are below. To contact any of these organizations, see "Agencies and Organizations" on pages 450-454 of the Appendix.

- Occupational Safety & Health Administration (see OSHA), U. S. Department of Labor
- National Safety Council (see NSC)
- National Wooden Pallet and Container Association (see NWPCA)
- American Society of Safety Engineers (see ASSE)
- American Industrial Hygiene Association (see AIHA)
- Gypsum Association (see GA)

- Ceiling and Interior Systems Construction Association (see CISCA); for further information about safety practices in installing ceilings, see the latest edition of (CISCA) Ceiling Systems Handbook.

Government agencies and non-profit organizations that may provide useful safety and health information are as follows:

EPA's Indoor Air Quality Home Page Contains information for the homeowner, schools, commercial buildings and environmental professionals on indoor air quality. It has extensive links to sites (<http://www.epa.gov/iaq>).

American Lung Association Home Page A national education program designed to help you make informed choices to improve your home's indoor environment (<http://www.lungusa.org> and <http://www.health-house.org/iaq>).

Canada's Indoor Environmental Program The Indoor Environmental Program integrates experimental, analytical and modeling competencies in the areas of lighting, acoustics, ventilation, indoor air quality, thermal comfort, energy efficiency and environmental psychology. The uniqueness of the Indoor Environmental Program lies in its integrated multi-disciplinary projects that combine the broad range of indoor environmental competencies with expertise from other IRC programs (<http://www.nrc.ca/irc/ie>).

Also listed below are several sources that you may want to consult further. Again, for professional construction, the advice and assistance of a safety professional is highly recommended.

- OSHA/National Association of Home Builders. Jobsite Safety Handbook. NAHB, 1201 15th St. N. W., Washington, DC 20005.
- Handling Gypsum Board, Gypsum Association Publication GA-801-93. Gypsum Association, 801 First Street, NE, #510, Washington, DC 20002; Tel: (202) 289-5440; Fax: (202) 289-3707; Western Office Tel: (602) 527-8466.
- Ceilings & Interior Systems Contractors Association (CISCA) 1500 Lincoln Highway, Suite 202, St. Charles, IL 60174; Tel: (630) 584-1919; Fax: (630) 584-2003:

Preventing the Fall: A Compliance Kit for OSHA's Fall Protection Standard. Includes a video, compliance manual, employee quiz, pocket checklist and employee training log. page manual. Member: \$75.00; Non-member: \$120.00.

Scaffold Safety Survival Kit. Includes a copy of the regulation, manuals for managers and employees, posters, and a videotape. Member: \$70.00; Non-member: \$110.00.

- Information available from the U.S. Department of Labor, OSHA/OICA Publications, P.O. Box 37535, Washington, DC 20013-7535:
Ground Fault Protection on Construction Sites—OSHA 3007.
Personal Protective Equipment—OSHA 3077

Fall Protection in Construction—OSHA 3146

Stairways and Ladders—OSHA 3124

- The following publications are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC (202) 512-1800:

Controlling Electrical Hazards—OSHA 3075 Order No. 029-016-00126-3; cost: \$1.00.

Hand and Power Tools—OSHA 3080—Order No. 029-016-00126-3; cost \$1.00.

- Information available for purchase from the American National Standards Institute (ANSI), 11 West 42nd St., New York, NY 10036; Telephone: 212.642.4900 or 764.3274:

ANSI A10.2-44 Safety Code for Building Construction

ANSI A10.3-70 Safety Requirements for Explosive-Actuated Fastening Tools

ANSI A12.1-67 Safety Requirements for Floor and Wall Openings, Railings, and Toe Boards

ANSI A14.1 1-68 Safety Code for Portable Wood Ladders. Supplemented by ANSI A14.1a-77

ANSI A14.2-56 Safety Code for Portable Metal Ladders, Supplemented by ANSI A14.2a-77

ANSI A14.3-56 Safety Code for Fixed Ladders

ANSI Z87.1-68 Practice of Occupational and Educational Eye and Face Protection

ANSI Z89.2-69 Practices for Respiratory Protection

ANSI Z89.1-69 Safety Requirements for Industrial Head Protection

Information available on the Internet

<http://www.osha.gov>:

A Guide to Scaffold Use in the Construction Industry. OSHA Pub. 3150 (1998), 77 pp. PDF file.

Selected Construction Regulations for the Home Building Industry. OSHA Regulation 29CFR 1926:

Subpart E - Personal Protective and Life Saving Equipment

Subpart I - Tools - Hand and Power

Subpart K - Electrical

Subpart L - Scaffolds

Subpart M - Fall Protection

Subpart X - Stairways and Ladders

