THE GYPSUM INDUSTRY

Maintaining the highest standards.
Aspiring to the highest ideals.

GYPSUM ASSOCIATION

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The Gypsum Association is an international, not-for-profit trade association that is tax exempt under Section 501 (c) 6 of the Internal Revenue Code. The Association is based in the Washington, DC area, and was formally established in 1930 and incorporated in the State of Illinois in 1961.

The Association's membership includes all the active gypsum board manufacturers based in the U.S. and in Canada. A firm or corporation must calcine gypsum and manufacture gypsum board under the provisions of ASTM standard C 1396 to be eligible for membership in the Association.

The Association provides technical, promotional, statistical, informational, and legislative monitoring services to its members and interested parties. Technical publications and promotional materials are generated by the Association for use by its member companies and the general public.

Table of Contents

2 Gypsum Industry Overview

3 What Is Gypsum Board?

4 How Gypsum Board Is Manufactured

5 History of Gypsum Board In North America

10 History of The Gypsum Association

16 Gypsum Industry Vital Statistics

18 Synthetic Gypsum

20 Gypsum Board Manufacturing Standards

GYPSUM ASSOCIATION

Gypsum Industry Overview

Twenty years ago, the North American gypsum board manufacturing industry was comprised of 16 companies. Many were small, regional, one- and two-plant enterprises, and most produced only gypsum board and gypsum plaster.

Today, the composite industry includes eight manufacturing entities that ship over 99% of all the gypsum board, gypsum panels, and gypsum plaster products sold in the United States and Canada. All are members of the Gypsum Association and many are global companies that also manufacture other building materials such as wood products, insulation, ceiling grid, and clay pipe. The U.S. members of the Gypsum Association directly employ over 10,000 individuals and have annual full-capacity sales of more than $10 billion.

The modern gypsum board manufacturing industry is at the forefront of the sustainability movement. Over one-third of the material used to manufacture gypsum board is recycled from other industrial processes and the facing material on paper-faced gypsum products is 100% recycled paper. Many production facilities use only recycled material to manufacture gypsum products.

Gypsum board is everywhere. It covers the interior of more than 97% of the new homes constructed in the U.S. and Canada, and is used to finish the interior and sheath the exterior of non-residential structures throughout the world.

From a humble beginning as a plaster lath, gypsum board has evolved to include products that provide increased sound attenuation, superior impact and weather resistance, and improved mold and mildew resistance, while continuing to display the natural fire-resistive quality inherent in gypsum.

What is Gypsum Board?

Gypsum board is the technical product name used by manufacturers to define a specific gypsum-core board material that is typically installed on the walls and ceilings of the interior or exterior of a residential or non-residential structure. The product is defined by the ASTM C11 standard as "the generic name for a family of sheet products consisting of a noncombustible core primarily of gypsum with paper surfacing." Drywall and plasterboard are non-technical synonyms for gypsum board.

Gypsum board differs from products such as plywood, hardboard, and fiberboard because of its non-combustible core. It is designed to provide a monolithic surface when joints and fastener heads are covered with a joint treatment system.

Gypsum wallboard is the most common type of gypsum board and is the predominant type used as a wall and ceiling surfacing. Most of the wall and ceiling surfaces in a home are covered by gypsum wallboard.

Members of the Gypsum Association also manufacture gypsum sheet products that do not have a paper facing. These products are called gypsum panel products and are defined by the C11 standard as "a family of sheet products consisting essentially of gypsum." Glass mat-faced panels and panels manufactured without a facing that have a gypsum core are examples of gypsum panel products.

The commonality between the board and the panel definitions is the gypsum core. The core often contains additives, but to be considered a gypsum board or panel, and be regarded as drywall, the core must be predominantly gypsum.

There are many types of gypsum board. Standard size gypsum boards are 48 or 54 inches wide and 8 (2440 mm), 10 (3050 mm), 12 (3660 mm), or 14 (4270 mm) feet long. Board is available in thicknesses from 1/4-inch (6.4 mm) to 1-inch (25.4 mm) thick, with the most common being 1/2-inch (12.7 mm) and 5/8-inch (15.9 mm) thick material.

Gypsum boards and panels are manufactured for use in a variety of applications and performance situations: ceramic tile and marble backing materials, exterior building sheathings, plaster bases, elevator and pipe shaft enclosure systems, and ceiling and soffit enclosures. Modern manufacturing permits specialized additives and sheet materials to be placed in boards to provide increased impact resistance and sound attenuation qualities.

Gypsum board is the premier building material for wall, ceiling, and partition systems in residential, institutional, and commercial structures. Gypsum products provide fire resistance, sound control, economy, versatility, quality, and convenience.

Gypsum is also used in other ways, such as a base for orthopedic casts, as a soil amendment, as a food additive, and as an inert additive to many food and cosmetic products.

How Gypsum Board is Manufactured

Natural gypsum is a mineral and is extracted by quarrying or mining veins of ore that occur near the earth's surface. Synthetic gypsum is a by-product primarily from the desulfurization of flue gases in fossil-fueled power plants. Both natural and synthetic gypsum are calcium sulfate ($CaSO_4 \bullet 2H_20$). They have the same general chemical composition.

Prior to the 1980s, virtually all the gypsum used to manufacture gypsum board and gypsum plaster was natural gypsum. While the technology to create synthetic gypsum was developed in Europe in the 1930s and scattered references to its existence are found in industry records prior to World War II, the wholesale use of synthetic gypsum to manufacture gypsum board did not occur in the U.S. until the 1980s.

One hundred pounds of gypsum contains approximately 21 pounds (or 10 quarts) of chemically combined water. To initiate the manufacturing process, natural gypsum rock or synthetic gypsum is crushed to a powder. The powder is heated to about 350 degrees F, driving off three fourths of the chemically combined water in a process called "calcining." The calcined gypsum (or hemihydrate) is then used as the base for gypsum plaster, gypsum board, and other gypsum products.

To produce gypsum board, the calcined gypsum is mixed with water and additives to form a slurry that is fed between continuous layers of paper on a board machine. The paper edges of the board are machine-wrapped as the face and back paper become chemically and mechanically bonded to the gypsum core.

As the board moves down a conveyer line, the calcium sulfate recrystallizes or rehydrates, reverting to its original rock state. The board is then cut to length and conveyed through dryers to remove any free moisture.

Subsequent to drying, board is inspected and trimmed to its final length. Individual boards are placed face-to-face in pairs to form a two-sheet "book." The cut ends of the book are bound together with end bundling tape and the board is then prepared for storage or shipping.

History of Gypsum Board in North America

Modern gypsum board has as its predecessor a product called "Sackett Board," a composite material that was made of layers of thin plaster placed between four plies of wool felt paper. Sackett Board was patented in 1894 by Augustine Sackett, the man generally considered to be the grandfather of the gypsum board manufacturing industry.

Prior to 1894, gypsum had been used for thousands of years as a building material and as an architectural detailing element.

The first use of gypsum in building construction appears to have occurred in 3700 B.C. when the Egyptians used gypsum blocks and plaster applied over woven straw lath in the building of the pyramid of Cheops. As a testimony to the strength and durability of gypsum, some of this construction is still intact and viewable, including walls decorated with murals composed of tinted plaster.

Further evidence of the historical roots of gypsum includes its use in the palace of King Minos of Crete around 1200 B.C. and its presence in alabaster, a form of gypsum used by sculptors during the Middle Ages.

In the late 1700s, the French chemist Lavoisier analyzed the chemical make-up of gypsum. His work, and subsequent research by a group of his contemporary chemists, coupled with the discovery and mining of huge reserves of gypsum near Paris, led to the wholesale use of "Plaster of Paris" as a building material. Plaster of Paris is raw gypsum that is chemically altered by heat to remove much of the water contained in the gypsum molecule and then hydrated to make it useable as a plastering material. It remains a viable product to this day.

Coming to America

At about the same time, Benjamin Franklin brought to America the concept of using gypsum for agricultural purposes. During a trip to France, Franklin had observed farmers using gypsum as a soil

additive. He was so impressed by the idea that he began to enthusiastically promote it upon his return to America. The U.S. imported gypsum from Nova Scotia until 1792, when large gypsum beds were discovered in New York State. For roughly the next 100 years, the primary use of gypsum in the U.S. was as a soil additive. During that period, gypsum mines opened in several locations, most notably near Ft. Dodge, Iowa, which eventually boasted the nation's highest concentration of gypsum facilities in the U.S.

In 1880, Augustine Sackett and Fred Kane conceived the idea of producing a wallboard product from straw, paper, and tar, and designed a machine to manufacture it. Initially, they were able to produce only a highly combustible unusable product, but they persisted, and in 1888 developed "Sackett Board" using plaster of Paris sandwiched between several layers of felt paper.

A sheet of Sackett Board was approximately 3/16 of an inch thick and 36 inches square. It had open edges, which tended to erode, and the felt paper did not provide for a satisfactory wall finish. However, it was an excellent base for the application of gypsum plaster and it soon became a replacement product for wooden slat lath.

Product Improvements

The acceptance of Sackett's product was helped by simultaneous advancements in gypsum plaster technology – most notably, changes in formulation that improved both the workability and the working time of gypsum plaster. To demonstrate the potential of gypsum plaster, the Alabaster Company used a mixture of gypsum plaster and fiber to finish the exterior of the 1893 Chicago World's Columbian Exposition, thus filling the largest single order of gypsum plaster completed to that date.

In 1894, Sackett patented his manufacturing process for Sackett Board. He opened several production facilities over the next eight years, and by 1901 he was producing nearly 5 million square feet of board annually.

Sensing the promise for the material, a group of small gypsum producers combined to form the United States Gypsum (USG) Company. By the end of 1902, the company had a total of 37 operations. In 1907, the Canadian Gypsum Company was formed, providing access to gypsum deposits in Nova Scotia.

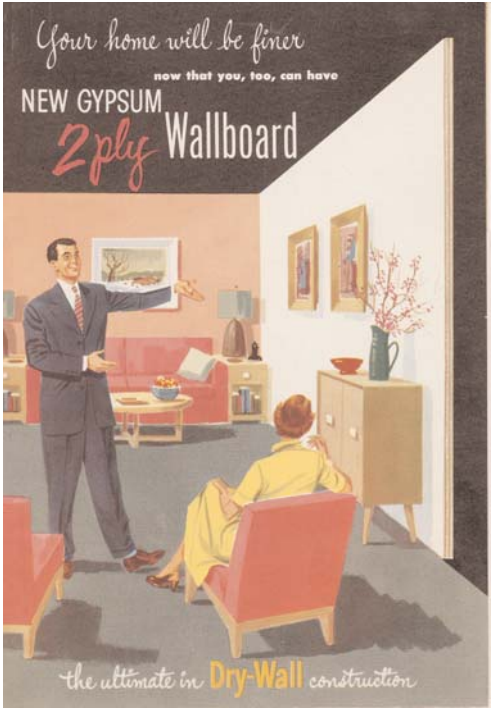
In 1909, Sackett sold the Sackett Plaster Board Company to USG, where he served as a director until his death in 1914. In 1910, a process for wrapping the board edges was created. This was followed in short succession by the elimination of the two inner layers of felt paper, the replacement of the exterior felt facing with a paper-based covering, and the production of board in standard four-foot widths. By 1916, Sackett Board had evolved into a ready-to-finish panel; within a year, the production of the original product was discontinued.

Helping the War Effort

The demand for gypsum board accelerated during WWI. The first call-up of U.S. troops in 1917 created an urgent need for temporary military housing, both at home and overseas. The military used a variety of building materials to meet this need; however, a barracks fire that took the lives of several servicemen prompted military specifiers to look for naturally fire-resistant materials. Gypsum board met this need and, consequently, became the preferred building material for military housing construction.

In the 1920s, several companies joined the gypsum board industry, including CertainTeed Products Company and the National Gypsum Company. Notable technological improvements during the decade included the invention of air-entrainment equipment to make board lighter and less brittle, and the evolution of joint treatment materials and systems.

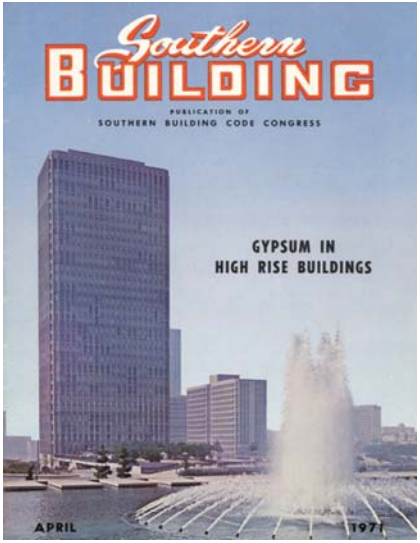
On April 17, 1930, the Gypsum Association was founded by 12 gypsum producers.



Early on, the Association conducted several fire resistance tests that enabled member companies to use the approved designs, provided that they certified that their products complied with the tested materials.

During the 1940s, gypsum wall sheathing and gypsum roof sheathing products were used along with gypsum board in domestic and overseas military construction. By 1945, the military had used approximately 2.5 billion square feet of gypsum board.

The 1950s brought many innovations in gypsum board technology, including the listing of additional fire tests, the development of specialized fasteners for the attachment of board, and the use of gypsum board in curved partitions, studless partitions, and sound control systems. Light-weight gypsum lath, plaster, and gypsum board systems fueled a boom period for gypsum products in both residential and commercial construction. By 1955, roughly 50% of new homes were built using gypsum wallboard; the other 50% were built with gypsum lath and plaster. The period immediately after World War II also saw the first wholesale marketing of type 'X' gypsum board, which has higher fire-resistance ratings.



Use in Commercial Construction

In the 1960s and 1970s, the industry focused on expanding the use of gypsum board in commercial construction, concentrating in particular on apartment building and office tower design solutions. To meet the specialized demands of high-rise construction, the industry developed innovations such as gypsum board shaftwall systems and movable partition systems, as well as “improved” type X core gypsum products. The industry proudly advertised their use in the John Hancock Center (100 stories) and the Sears (now, Willis) Tower (110 stories), among others.

The past two decades have seen the development and marketing of gypsum board firewall systems to separate individual townhomes and condominiums, and the unlocking of the vast possibilities of the potential for synthetic gypsum.

By the 1990s, entire board production facilities were dedicated solely to using synthetic by-product gypsum for the manufacturing of board. The period also saw a trend toward the development of specialized board and panel

products. Using the basic gypsum board theme as a template, industry researchers have continued to create a wide range of proprietary materials to meet modern design and serviceability demands.

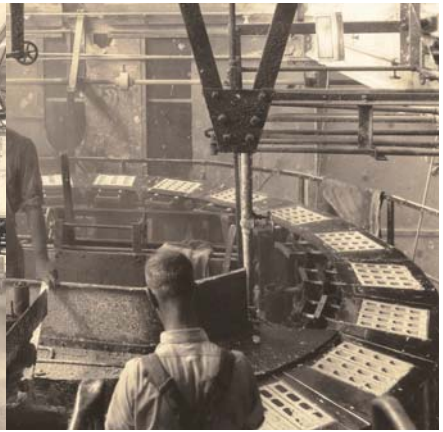
From a somewhat humble beginning as a basic building material, gypsum board has become the interior finish material of choice in the North American construction market. The ability of the basic gypsum mineral to adapt to a variety of circumstances has allowed it to be recast and reformulated over many centuries into a variety of different materials. Adaptive uses for gypsum are still being sought and its future as a building material remains bright.

History of the Gypsum Association

Prior to the formal establishment of the Gypsum Association, several gypsum manufacturers had supported an informal Chicago-based organization known as the Gypsum Industries. The Gypsum Industries developed standards through third-party organizations and supported a research associate at the National Bureau of Standards. In the late 1920s, several constituents of the gypsum industry agreed that creating a formal association offered a number of advantages over continuing to operate as the Gypsum Industries.

First Association Meeting

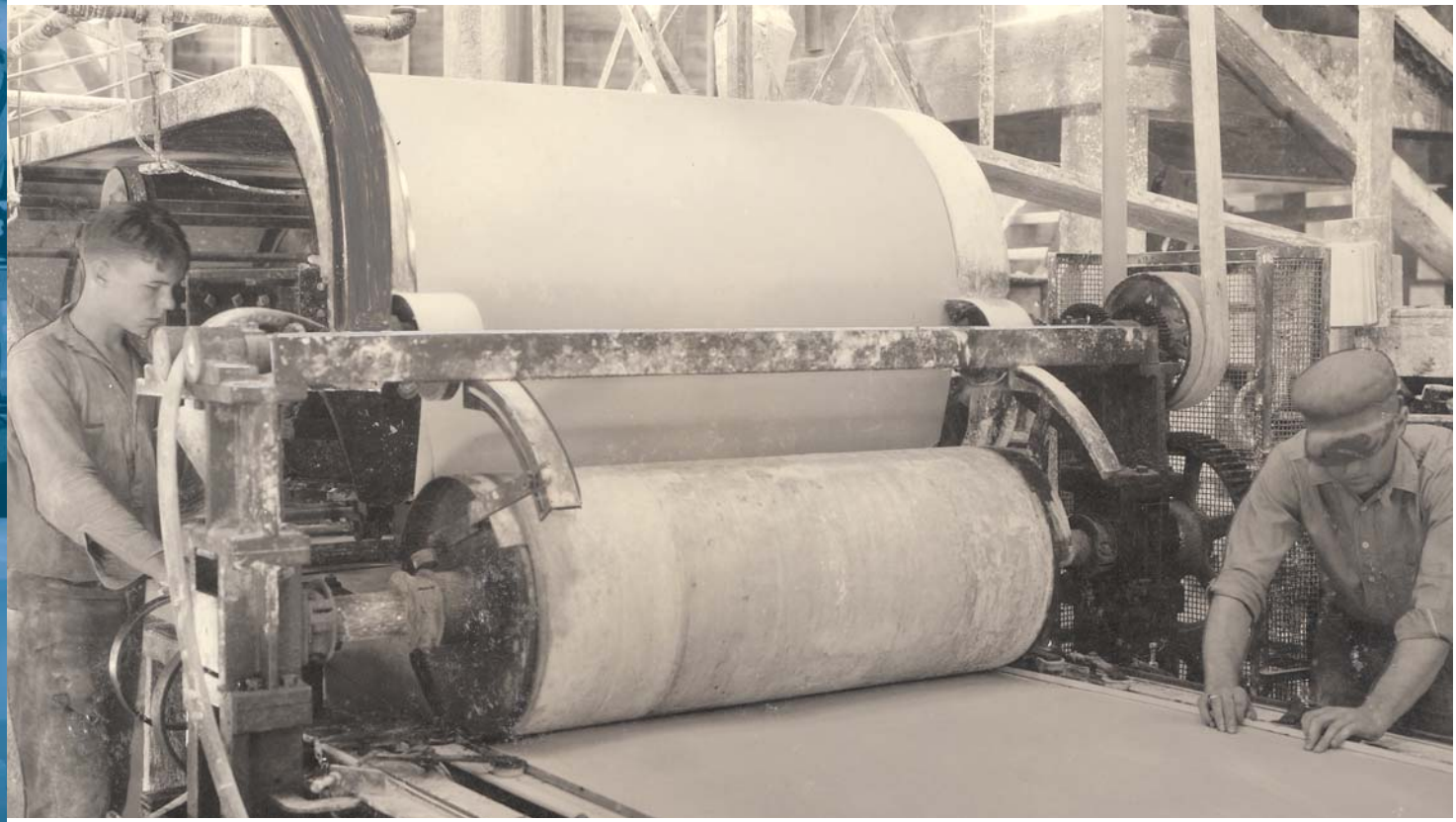
The first meeting of the Gypsum Association was conducted on April 17, 1930. Representatives of 12 gypsum companies met at the Palmer House Hotel in Chicago and discussed, among other topics, "dues; renting a 'suitable' office; and furnishing of the same." During the meeting, authorization was given to hire Henry Schweim as "engineer of the Association." Schweim quickly established the first Association office in downtown Chicago. By the end of the year, he had been appointed Secretary of the Corporation and began to serve as Chief Executive Officer of the Association, a position he would hold until 1947.

Early Association activity focused on increasing the use and specification of gypsum plaster products, solving technical problems, and negotiating "rail traffic" agreements on behalf of the plaster industry. In 1931, the Technical Problems Committee received approval for funding to conduct four gypsum plaster system fire tests with the National Bureau of Standards. Thus began a practice that would become the hallmark of the Association: developing and providing fire-rated gypsum building systems for the construction industry.

Post-Depression Era

In 1933, the federal government passed the National Industrial Recovery Act (NIRA) in an attempt to revive the economy. The Association responded quickly and volunteered to participate in a NIRA program in which it would develop the Code of Fair Practice for the Gypsum Industry. The majority of gypsum companies were located east of the Rocky Mountains; however, several producers had sprouted up in the west, and by 1935, a Pacific Coast division of the Gypsum Association had emerged.



Moving From Plaster to Board

The period immediately following World War II saw a shift in demand away from gypsum plaster and toward gypsum board. Seeking ways to expand the market for gypsum board products and anticipating the forthcoming housing boom, the Association enlisted Underwriters Laboratories to fire-test and label gypsum sheathing in 1945. The program marked the first time that the industry cooperatively tested a gypsum board product.

In the late 1940s, the Association also began a decade-long public relations campaign, targeting various interest groups, including architects, trade associations, architectural schools, federal agencies, homeowner associations, and community service clubs (e.g. Lions, Kiwanis, Rotary). The Association produced a number of brochures and three films, including "White Magic" – a 25-minute film intended to "dramatize gypsum and show its ability" to viewers. By 1955, "White Magic" had been shown in Paramount and Warner theaters, and had aired on television to an estimated audience of over 54 million people.

The Fire Resistance Design Manual

By 1958, the Association had conducted enough tests and gathered enough data to produce a complete reference document on fire-resistant gypsum systems. Oddly, despite a cooperative fire testing program for gypsum board that had started in the 1940s, the first edition of "The Fire Resistance Manual" contained no gypsum board systems. However, when it was reissued in 1961, gypsum board systems were included and the document was renamed the "Fire Resistance Design Manual," which it is still called today. In 1968, to meet industry demands, the Association began to include sound, structural and assembly information in the manual.


New Movie---
tells the Story of Gypsum

Today's manual contains over 400 systems incorporating gypsum board, gypsum plaster,

and a variety of specialty gypsum panel products. Re-issued on a three-year cycle, the manual is referenced by model building codes as a source of fire-resistive designs and is the most widely distributed of the nearly 30 technical publications produced by the Association.

Manufactured Housing

The use of gypsum board in apartment and office buildings had grown substantially during the 1960s, in no small part because of its fire-resistant and sound attenuating properties; however, the 1970s saw a downturn in the economy, and as a result, the conventional housing and commercial construction markets stalled. By contrast, the manufactured housing market, with its more affordable products, grew in popularity. In 1975, the Association began work on standards for gypsum products used in manufactured housing.

In 1976, the Association developed a film entitled “Beauty with Safety” that demonstrated the fire resistance advantages of gypsum board used in place of Luan plywood as an interior surfacing material in manufactured housing. The film was reinforced by a 1979 National Institute of Building Sciences study on manufactured housing that rated gypsum products favorably and helped to quickly increase the use of gypsum products in manufactured housing from almost nothing to an estimated 50% of interior surfaces.

The 1980s to the Present

With the broad acceptance of gypsum board products within the construction community, Association efforts during the past three decades have focused largely on technical education and promotion. Since 1980, the Association has substantially expanded its technical publication library through the introduction of many new titles, some of which are also produced in French and Spanish, as well as English.

The Association was also a primary force behind the creation of the landmark GA-214, “Levels of Gypsum Board Finish” brochure. When released to the public in 1992, GA-214 was the first document to effectively instruct

wallboard finishers on the proper techniques for achieving specific levels of gypsum board finish quality. Jointly published by the Association and three (now four) other industry organizations, the document was produced after a multi-year series of industry meetings and negotiations.

More recent educational efforts have focused on the architectural and design community via a series of CD-ROM and on-line programs to help end users obtain Continuing Education credits. In 2002, the Association initiated funding for a multi-year program to promote the use of gypsum board townhouse separation wall and gypsum board roof underlayment systems. Using a variety of media, the organization has sought to educate specifiers, designers, and builders about the options offered by gypsum board townhouse separation wall systems.

During the coming decades, new promotional programs and technical documents will be created by the Association as market conditions change and new products emerge. Given the broad acceptance of gypsum board as a desirable building material, it is likely that the history of the Gypsum Association is only partially complete.

Gypsum Industry Vital Statistics

Gypsum is omnipresent in modern construction. Nearly every house constructed or renovated in the past 40 years has incorporated gypsum board on most of its walls and ceilings. Hotels, office buildings, schools, and even detention facilities are full of gypsum board, gypsum panels, and gypsum plaster.

Gypsum Use and Consumption

The members of the Gypsum Association use approximately 65% of the natural gypsum mined and quarried in the U.S. and approximately 60% of the synthetic gypsum produced in the U.S. to manufacture gypsum products. Natural gypsum produced by Association members that is not used to manufacture gypsum products is used primarily as a Portland cement retarder or as an agricultural supplement.

Natural gypsum is an abundant commodity that is produced in 85 countries. In 2007, the United States was the second largest global producer of natural gypsum, ranking behind only China[1]. Significant reserves of high-quality natural gypsum exist in the United States, Canada, and Mexico.

In the United States, gypsum was mined or quarried in 17 states in 2007[2]. In a typical year, approximately one-third of the natural gypsum used to manufacture gypsum board is imported to the U.S. from Canada and Mexico. Gypsum is largely consumed on the continent of origin.

Synthetic gypsum is produced throughout the U.S. and most is a by-product primarily from the desulfurization of flue gases in fossil-fueled power plants. Most synthetic gypsum is manufactured in the mid-Atlantic, southeastern and midwest regions of the U.S. Facilities using synthetic gypsum as an ingredient for gypsum board are generally

[1] *2007 Minerals Yearbook; Gypsum [Advance Release]*; U.S. Department of the Interior; U.S. Geological Survey; September 2009
[2] Ibid.

located in the same geographic area as the synthetic source.

Economic impact of the Gypsum Industry

A 2009 study of the gypsum industry conducted for the Gypsum Association found the value of "put-in-place" wallboard in residential construction to be approximately $35 billion in 2008. Of that total, approximately 20% ($7 billion) was wallboard material cost. In 2008, residential construction accounted for approximately $500 billion in total "spend costs" and accounted for approximately 45% of total U.S. construction direct spending.

The 2009 study also noted:

- Based on data from the National Association of Homebuilders, each new home built creates (through jobs) $231,000 of economic income and $89,000 of tax revenue.
- Material and labor cost to drywall a typical house accounts for approximately 10% of the home's total construction cost.

In 2008, the average new one-family home contained 2,519 square feet of floor area[3]. On average, a single-family house incorporates approximately 8,500 to 9,000 square feet of gypsum board, or about 200 sheets of 4x12 foot board.

Gypsum Industry Characteristics

Annual gypsum board shipments by U.S. manufacturers totaled 24.8 billion square feet in 2008. Nearly 800 million square feet of gypsum board was exported and about 400 million square feet was imported into the U.S. – almost exclusively from Canada and Mexico.

U.S. production for the gypsum board manufacturing industry in 2009 was 18.1 billion square feet.

Gypsum Association members operate over 70 plants in the U.S. and Canada and annually produce over 99% of the board sold in the U.S. Gypsum board is shipped by both truck and rail to distributors, distribution centers, and retailers.

A typical gypsum manufacturing facility often employs 100 to 150 people. Many more are employed in transport and other related industries. Since plants are often located in rural areas, gypsum board manufacturing facilities are typically among the largest local employers and economic drivers.

[3] U.S. Census Bureau, *Characteristics of New Housing, Median and Average Square Feet of Floor Area in New One-Family Houses Completed by Location*, www.census.gov/const/www/charindex.html; accessed December 21, 2009

Synthetic Gypsum

The principal source of synthetic gypsum in North America is the flue-gas desulfurization (FGD) process, as power-generating or similar plants remove polluting gases from stacks to reduce the emission of harmful materials into the atmosphere. Synthetic gypsum that is suitable for use in wallboard includes FGD gypsum, fluorogypsum, citrogypsum, and titanogypsum – the last, a by-product from titanium dioxide manufacturing.

Some types of synthetic gypsum are considered unsuitable for use in gypsum board due to potential environmental hazards; for example, phosphogypsum may contain radon and radionuclides. Synthetic gypsum with such potentially harmful contents is not used to manufacture gypsum board. Members of the Gypsum Association do not use phosphogypsum to manufacture any gypsum-based product.

Manufacturing FGD Gypsum

The burning of pulverized coal in electric power plants produces sulfur dioxide (SO_2) gas emissions. FGD gypsum is produced by passing SO_2 gas through limestone in the air pollution control scrubber tower. The resultant scrubber sludge is either placed in a landfill or subjected to forced air oxidation to produce high quality FGD gypsum suitable for the manufacture of gypsum board. The dried, purified, high quality wallboard-grade gypsum must meet strict quality specifications used in the manufacture of gypsum board.

FGD gypsum used for the manufacture of gypsum board is generated by a separate process from the combustion of coal. Unlike other coal combustion products, FGD gypsum is specifically manufactured using a controlled process.

FGD gypsum is not fly ash or bottom ash. Bottom ash is the residue that remains at the bottom of a coal furnace. Fly ash is the trace particulate that is released into the stack. Fly ash is typically captured from the stack before the FGD manufacturing process begins. Members of the Gypsum Association do not use fly ash or bottom ash as a substitute for gypsum in manufacturing gypsum board.

Manufacturing Gypsum Board

Once produced, the wallboard-grade synthetic gypsum is transported in bulk to a gypsum board manufacturing facility where it is dried to remove surface moisture, then crushed into a fine powder. Synthetic gypsum can be used as the sole gypsum ingredient in gypsum board or it can be combined with natural ore. Synthetic and natural gypsum have the same general chemical composition.

In 2008, approximately one-third of all the gypsum used to manufacture gypsum board in the U.S. was synthetic gypsum. The U.S. gypsum industry diverted almost 8 million short tons of FGD gypsum to board manufacturing that otherwise would have been sent to local landfills.

Wallboard-Grade FGD Gypsum

Washed FGD gypsum is a safe product that presents very little risk to the environment. Testing has shown that the quantities of trace metals in wallboard-grade FGD gypsum are less than those in soil or groundwater used as drinking water. Gypsum board incorporating high quality wallboard-grade FGD gypsum has been installed in millions of homes and commercial buildings in the United States and Canada.

Gypsum Board Manufacturing Standards

Gypsum board (drywall) and gypsum panels are specifically manufactured to ASTM standards as shown on the chart on the opposite page.

All of the standards list specific criteria for product evaluation. ASTM C1396, for example, lists specific criteria for evaluating gypsum board products. These include general physical characteristics applicable to all gypsum boards, such as flexural strength, humidified deflection, and nail-pull resistance; and characteristics such as water resistance and water absorption for specific board products.

A material must fully comply with all of the criteria in the specific standard. Evidence of selective evaluation should raise questions about a product, especially if it clearly does not comply with the scope of the standard being used as a reference.

Gypsum Board and Panel Standards

Standard	Title	Board or Panel Product
C 1396	Gypsum Board	Paper-faced gypsum boards including: • Gypsum wallboard • Gypsum shaftliner • Water-resistant gypsum board • Gypsum sheathing board • Veneer plastic base • Gypsum lath • Gypsum ceiling board and exterior soffit board
C 1177	Glass Mat Gypsum Substrate for Use as Sheathing	Glass-mat faced panels used as exterior substrates
C 1178	Coated Glass Mat Water-Resistant Gypsum Backing Board	Coated glass-mat faced water-resistant panels used as a base for tile
C 1278	Fiber-Reinforced Gypsum Panel	Interior and exterior cellulose fiber-reinforced gypsum panels
C 1658	Glass Mat Gypsum Panel	Glass-mat faced: • Interior gypsum panels • Shaftliner panels • Water-resistant panels used as a base for tile (other than C 1178 material)

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