

Pyrobar®

For www.fireengineering.com

by Gregory Havel

Photo by author

One of the first successful gypsum-based construction products, besides plaster, was Pyrobar®, manufactured by U. S. Gypsum (now a subsidiary of USG) beginning in 1903, and in regular use into the 1960's.

These gypsum blocks were larger than concrete blocks: usually 16 inches high by 32 inches long, while concrete blocks are 8 inches high and 16 inches long, including mortar joints. They were available in 4, 6, and 8-inch thicknesses, and were much lighter due both to the horizontal cores that they contained, and to the lighter weight of gypsum compared to concrete. They were designed to be laid up like a masonry wall with mortar, and the surfaces on both sides were ready to be finished with plaster.

The gypsum material does not have enough strength for use as load-bearing walls. It was common for a building with a steel frame to have its interior partitions built of Pyrobar® and plaster, and for the steel columns and beams to be enclosed with the same material for fire resistance. It was common in schools, commercial buildings, hospitals, and apartment buildings.



The photo was taken in 2004, during the renovation of a mansion built in southeastern Wisconsin around 1950. It shows both four and six-inch Pyrobar®, with part of the enclosure of the steel column removed, and an electrical conduit running horizontally through a core in the gypsum block.

Since gypsum is calcium sulfate with water bound up in its molecules (the chemical formula for hydrous calcium sulfate is $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$), it is naturally fire-resistant and noncombustible. It takes a lot of heat to drive the water out of gypsum. Walls of plastered Pyrobar® with one and two-hour fire ratings were common, and the material could be used to achieve three and four-hour fire ratings.

There are still many buildings



that were built using this material, even though it has not been manufactured for more than 40 years. While the gypsum block was never manufactured using asbestos, a known carcinogen, the mortar with which it was laid often contained significant amounts—an argument in favor of gross decontamination of firefighters after interior firefighting or overhaul, before we remove our SCBA and other personal protective equipment.

Any manufacturers or brand names noted above are used only as examples, and the websites only as sources of additional information. Reference to them is not an endorsement of either product or manufacturer.

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