

GYPSUM, LIME AND BUILDING PRODUCTS February Issue

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Discovering economical solutions to store gypsum is always a concern. In the past couple of years, the gypsum industry has been turning to dome silos as an economical alternative to store bulk gypsum. Dome silos are ubiquitous in the cement industry and their presence is increasing in the fertilizer, mining and gypsum industries.

The dome has several advantages over other storage systems. Domes can be built quickly regardless of most weather conditions because dome construction takes place in a protected environment. The construction of the reinforced concrete shell is on the inside of an inflated airform. The airform not only provides a protective covering during construction but also provides a waterproof roofing system for the dome once the dome is completed.

Dome construction costs are typically less than concrete silos. Because the dome requires less land space than flat storage, it is generally more economical to load and unload a dome than traditional flat storage buildings. For these reasons, dome storage is being used more often to store gypsum. This article highlights five gypsum storage domes that have been recently built.

Two gypsum storage domes were constructed in 1998. The first dome was constructed at Moncks Corner, Santee South Carolina. The dome is 100 ft in diameter by 50 ft high (30.5 m x 15.2 m) storing approximately 5,000 ton (4500 mt) of gypsum. This storage dome was built on an existing concrete pad that had previously been used to store an open pile. Dome Technology cut a circular ring out of the concrete pad and replaced it with a ringbeam foundation on which the shell was built. The concrete pad inside the foundation then served as the floor of the dome. Front-end loaders are used to reclaim the gypsum from the dome.

Picture of Santee Cooper

The second gypsum dome was constructed in Gypsum, Ohio for US Gypsum. This dome is 120 ft in diameter by 50 ft high (36.6 m x 15.2 m) storing approximately 5,500 ton (5000 mt). Reclaim is also by front-end loaders.

Picture of US Gypsum

In 1999, Dome Technology constructed a dome for National Gypsum at their plant in Shipping Port, PA. This dome is the largest gypsum storage dome of its kind measuring 200 ft in diameter by 100 ft high (61.5 Mx x 30.5 m) storing synthetic gypsum. The

dome was built in the wintertime, yet construction of the dome with its unique ringbeam foundation was built in 10 weeks.

Typically most domes are loaded by a conveyor dropping the product through a center opening at the top of the dome distributing the pile load evenly on the dome walls. This dome is loaded asymmetrically by a conveyor piling the gypsum against one side of the dome. Many structures could not handle this type of loading. Another unique aspect of this dome is that the dome has an opening approximately 135 ft supported by only two columns allowing multiple front-end loaders access to reclaim the gypsum from the dome.

Picture of Shipping Port

Two more gypsum storage domes began construction in 2000. In the third quarter of 2000, Dome Technology completed a dome for a power plant in Homer City, PA. The dome stores 8,250 ton (7500 mt) of gypsum. The dome is 128 feet in diameter by 69 feet high (39 m x 21 m). Dome Technology's contract was with ABB Environmental. Product is reclaimed manually by front-end loaders.

Picture Homer City

Decker Industries was awarded a contract to supply discharge equipment to National Gypsum's new plant at Apollo Beach, Florida. The 200-foot diameter by 100-foot high dome was completed in the fourth quarter of 2000. This dome is the same size as National Gypsum's dome in Shipping Port, PA. Instead of unloading the dome by using front-end loaders, the FGD gypsum is reclaimed automatically using a rotary plow system.

No Picture Available of Apollo

Dome Technology invented the monolithic dome almost 26 years ago and has constructed more than 400 domes worldwide. Currently, Dome Technology has 10 dome projects under construction. Within the first quarter of this year, 11 more dome projects will begin. Projects that are slated to start within the next three months are for fertilizer, cement, public school buildings and commercial buildings.