PLAINTIFF'S EXHIBIT
GP-1023

Chapter V

CRUSHED ROCK FOR PORTLAND CEMENT MANUFACTURE

Tremendous quantities of crushed gypsum rock are used to retard the setting time of Portland Cement. From 1.5% to 6.5% gypsum is usually added to the cement clinker and the mixture is then ground up together to a fine intimately mixed powder. According to standard specifications, Portland Cement cannot contain more than 3.0% sulphur trioxide (SO_3) and as the amount added is carefully regulated, most cement producers purchase gypsum rock on specifications as to the size of the rock and the percent SO_3 in the rock. Ordinarily two sizes of crushed gypsum rock are furnished; (a) ungraded in which all the rock will pass a $1\frac{1}{2}$" screen including all fines and; (b) graded in which all passes a $1\frac{1}{2}$" screen and is retained on a $\frac{1}{2}$" or a $\frac{1}{4}$" screen, thus eliminating most of the fines.

Specifications for sizes other than these should be first referred to the Manufacturing Department to see if it can be supplied. 100% pure gypsum contains 46.5% SO_3. As no gypsum rock deposit is 100% pure, Bestwall guarantees the following percentages of SO_3 at our various mills as follows:

Acme, Texas	Average Analysis	45.6% SO_3	-- 77.5% $CaSO_4$
Blue Rapids, Kansas	" "	46.0% "	-- 78.2% "
Sigurd, Utah	" "	45.1% "	-- 76.7% "

(Crushed rock (for retarder) is not available at Ft. Dodge, Grand Rapids or Akron, October 1958). Most complaints on crushed rock are on low SO_3 content; or too large a percent of fines in graded rock; or on wet rock. A complaint on low SO_3 almost always is found to be unjustified and is caused usually by improper or careless sampling of the shipment. A grab sample is not representative and the sampling must be done according to the well-recognized procedure of collecting a several hundred pound sample taken from all parts of the car, grinding and quartering down this sample so that the powder taken for analysis is representative of the entire car. Gypsum is one of the softest minerals found in nature and is easily abraided and broken so that in the process of screening, loading and unloading some fines are formed, so that in a graded rock some fines that will pass the smaller screen will be formed. However, this amount should not exceed 15% by weight. The free water in the rock from our mines will not exceed 1% and in most cases will not exceed 0.5%. Complaints on too much water in the rock are usually due to leaky box cars or uncovered gondolas and are not due to the presence of excess water in the rock as it comes from the mine.

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Another complaint that arises is presence of anhydrite. As noted, gypsum is normally a soft material. Anhydrite is very hard. This presents problems in grinding. Also, anhydrite has no water of crystallization and so gives a higher SO_3 content per ton. If not accounted for, the Portland Cement manufacturer runs into problems due to varying SO_3 content. Bestwall gypsum deposits noted have no anhydrite traces. Basically, anhydrite is avoided even in processing gypsum. There is some interest in the use of pure anhydrite in the manufacture of special Portland Cements. Bestwall is not in a position to ship straight anhydrite in carload quantities.

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Chapter V

AGRICULTURAL GYPSUM

Rock gypsum ground to a powder is commonly known as "land plaster" especially in its use as a fertilizer for the so-called leguminous crops which consist of clover, alfalfa, peas, beans, peanuts, etc. Land Plaster is a valuable plant food for such crops as it supplies sulphur and frees magnesia and potash for plant foods. It also increases the growth of the bacteria which transform available nitrogen into plant food. Hundreds of cars are used annually for fertilizing peanut crops in the Southern States. Land Plaster added to manure unites with nitrogen forming ammonium sulphate, a stable compound valuable as a plant food. A great deal is sold in the Western States also. A use in recent years has been as a treatment in ponds to clear the water. 600 pounds per acre per foot of depth after the spring rains will clear a body of water and improve it for the full summer.

Many states have Fertilizer Laws requiring a license and/or a fee to sell such a product as Agricultural Gypsum. In 1958 Bestwall had a license to sell Agricultural Gypsum in Oregon, Idaho, Washington and Utah. Schedule 3, page 3A contains a note listing states where Agricultural Gypsum may be sold without a license. Consult the General Sales Office for further information on where Bestwall has a license to sell Agricultural Gypsum or does not need one. When sold as "Ground Gypsum" no license is required.

Bestwall Agricultural Gypsum, or Bestwall "Ground Gypsum", is available at Acme, Akron, Blue Rapids, Ft. Dodge, Grand Rapids and Sigurd. The characteristics of this material for each is:

	Acme	Akron	Bl.Raps.	Ft.Dodge	Gr.Rap.	Sigurd
Agricultural Gypsum Ground Gypsum						
Average Purity Gypsum						
Average SO_3 Content %						
Grind % Retained 100 200						
Inspection						

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