Chapter III

Industrial Plasters

Sunflower Molding

This well known and popular brand is made from gypsum rock of over 99% purity at Blue Rapids, Kansas and is also made at Acme, Texas and Sigurd, Utah, from rock of over 98% purity. It is made by a special process which lowers the water carrying capacity to a minimum so that this plaster when mixed at plastering consistency with 50% water will give a tensile strength of over 500 lbs. per square inch and a compressive strength of over 3,000 lbs. per square inch on the set and dry casts. At pouring consistency when mixed with 70% water a tensile strength of over 300 lbs. and a compressive strength of over 2200 lbs. results. It contains no abrasive material.

After calcination and treatment in the kettle this plaster is reground to a fineness of 99.9% through a 50 mesh screen and 98.0% through a 100 mesh screen insuring a uniform fine texture and easy soaking and mixing properties. Its color is white. The setting time of this product is held within rigid specification limits at the plant so that it will set on the job in from 15 to 25 minutes depending on mixing conditions. For special uses the setting time can be made quicker or slower as desired. The heat developed as the plaster sets, is generated slowly, resulting in a cool working plaster that will not injure gelatin molds. The setting expansion when mixed with 50% water is 0.18% and when mixed with 70% water is 0.16%. Sunflower Molding is as good a molding plaster as can be made from gypsum and is unexcelled in quality the world over.

NOTE: A special fine grind (99% through a 100 mesh) is also available in limited quantities.

Common Molding Plaster of high quality is also made at the Fort Dodge, Iowa, plant in limited quantities.

The regrinding of molding plaster is done in buhrstone mills. These mills consist of two very hard circular stones enclosed in metal caps. Calcined gypsum is fed through a hole in the center of one stone which is stationary for further grinding. The other stone revolves at a high rate of speed and the gypsum or plaster is ground between the two stones. The distance the two stones are set apart determines the fineness of grind. Small grooves or channels are cut in the stones leading towards the outer edges. As the material is ground it is forced out of the mill through these channels by centrifugal force.

The Plasticity of the Reground Product:

The object of regrinding calcined gypsum through a buhrstone mill is to obtain a finely ground product without greatly increasing the plasticity. This type of mill accomplishes this purpose as a very fine powder of relatively low plasticity results.

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A requirement for plasters such as Sunflower Molding is that it shall mix easily to a smooth, pourable slurry with a minimum amount of mixing water. If the calcined gypsum is highly plastic it requires long mixing to obtain a desired pouring consistency, both properties highly undesirable in a casting plaster. The regrind in the buhr mills gives us the desired properties of fine grind, easy mixing with water with some decrease in the water carrying capacity.

Statuary Casting

This plaster differs from regular molding or casting plaster in that it contains a special ingredient which "case hardens" the finished cast. Objects cast with this plaster will have an extremely hard surface, resistant to marring and dense enough to be painted without preliminary sizing. Bestwall Gypsum Company's Statuary Plaster is made by blending a carefully selected amount of the case hardening ingredient with regular molding or casting plaster.

Plate Glass Stucco

For bedding the glass on continuous line machines, a pure, strong fast set, grit free calcined gypsum is used to which is added 2% to 5% hydrated lime. The lime causes the plaster to adhere more firmly to the glass. It is particularly important that the plaster used for the second side bedding shall be grit free, so that the polished glass will not be scratched as it is bedded or if it slips under the grinders or polishers. A special patented formula of plate glass stucco is also available for plants that do not want to go to the expense and uncertainty of adding lime. This formula is now used successfully in several of the largest plate glass plants in the country. A rather coarse ground low water carrying stucco is usually preferable as it releases from the glass better when the glass is taken from the table. The setting time is normally very quick and most customers request that the setting time regulated at our plants although one large customer does his own accelerating.

Plate glass stucco as made at our Blue Rapids Plant is unexcelled for this purpose. It is grit free, exceptionally strong and of a very uniform set. Although it is not necessary to use this grade of plaster for first bedding, some large concerns use it for both sides due to its strength and uniformity of performance. As soon as the proper setting time is determined for a particular operation no trouble is experienced with Blue Rapids plate glass stucco.

Stucco of somewhat lower purity, such as produced at our Fort Dodge plant is used for first bedding or "first side" purposes, however, it is not sufficiently grit free for use as second side stucco.

Impression Plaster

A fine ground, white, pure, quick setting plaster made from carefully selected rock, impression plaster is mixed by the dentist to a rather thick consistency and

placed in a small tray about the size of a jaw which is inserted in the patient's mouth. It hardens very quickly leaving a perfect impression of the entire upper or lower part of the mouth. Bestwall Impression Plaster is made by carefully blending fine ground, low water carrying capacity white stucco with accelerators to a 3 to 5 minute setting time. It may be further accelerated by the dentist with potassium sulphate or other accelerator.

Laboratory Plaster

This is the same high grade fine ground white plaster as Impression Plaster. The main difference is that it possesses a slower set of 10 to 20 minutes. The dentist uses this plaster for general laboratory work and for making models or casts over which vulcanizing can be done immediately. As considerable strength is desired the plaster should be mixed as thick as possible, so both sections of the mold between which the rubber plate is vulcanized are subjected to considerable pressure.

Orthopedic Plaster

A fine ground white plaster that will make a strong rigid cast. Ordinarily it is accelerated to set in from 10 to 15 minutes but a quicker or slower set may be desired according to the particular technique employed. It is used to make a rigid cast over a broken bone by immersing bandages in a rather thin plaster mix and wrapping the bandage tightly around the injured part. Very often the bandage is impregnated with dry plaster after which the roll may be immersed in water and wound around the injury. If a quicker set is desired powdered potassium sulphate can be added to the water. Bestwall Orthopedic Plaster is produced at both Acme and Blue Rapids.

Pottery Plaster

Pottery Plaster is made normally in three formulations, regular pottery plaster (K-55), a low water carrying and finer grind pottery plaster (K-59), and a high strength, thermal shock resistant, fine grind pottery plaster (K-61). Regular Pottery Plaster (K-55) is made in exactly the same manner as Sunflower Molding Plaster. It is white, pure, fine ground, low water carrying capacity stucco mainly produced at our Blue Rapids Plant under carefully controlled conditions. Fine ground extra low water carrying capacity pottery plaster (K-59) is a blend of slightly finer ground regular pottery plaster and Densite, the latter added to lower the water carrying capacity so that pottery molds can be cast at a lower water to plaster ratio to give improved hardness and mold life. K-61 is a blend of the finer ground regular pottery plaster, fine ground Densite and other ingredients.

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Densite

Densite is made by a patented process described on page . It is a very low water carrying, fine ground product producing smooth casts of very great hardness and strength. It has a T.C. of 22, a pouring consistency of 33, and a fineness of 92% to 95% through a 200 mesh sieve.

After the rock is calcined and dried, the lumps are broken up into particles, most of which will pass a 100 mesh screen in a swing hammer mill. At this stage it is gritty and harsh and looks and feels like fine, white sand. This material then is passed through a four-stage operation in a continuous stream for the following purposes:

1. Reground in a tube mill to reduce the particle size and increase the plasticity.

2. Reground through a buhrstone to break up any coarse flakes formed in the tube mill.

3. Passed through a reheater to remove any traces of free water or raw gypsum in order to make a more uniform set.

4. Passed through a fine screen to remove any extraneous matter present. The finished Densite is elevated into a bin over a mixer and a packer where all of the many added ingredients may be carefully proportioned and blended ready for sacking. Straight Densite is also packed without additives.

The whole Densite operation is under very close laboratory supervision.

With various additives the characteristics of a finished product can be controlled as:

(a) Setting Time

(b) Setting Expansion

(c) Strength

(d) Color

(e)

By this means, products are tailored to meet the requirements of a specific user.

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Crushed Rock

Crushed Rock for use in the manufacture of Portland Cement may be either crusher run rock including all fines or it may be graded rock to meet certain size specification. In the latter case, the crushed rock is passed over a series of vibrating screens which separate out the desired size for shipment. It is available for sale at Acme, Blue Rapids, and Sigurd.

Agricultural Gypsum

Rock gypsum ground to a powder is commonly called land plaster. This material is usually ground in Raymond mills so that 85% - 90% will pass a 100 mesh screen and is bagged without added ingredients. Agricultural Gypsum is available from Sigurd, Utah; Acme, Texas; and Fort Dodge, Iowa.

Terra Alba

Terra Alba is a very fine uncalcined gypsum processed so that at least 95% will pass a 325 mesh screen. It is normally made from pure white gypsum by fine grinding and air separating to the desired degree of fineness. It is not made by the Bestwall Gypsum Company.

Industrial Stucco

This product is made from light gray lower purity rock gypsums. It is usually treated to produce strong durable casts. Its setting time is about the same as Sunflower Molding Plaster.

Industrial Stucco is more or less a tailor-made material manufactured to suit the requirements of the purchaser so that no specifications can be given as to its set, grind and water carrying capacity.

Polishing Stucco

A fine ground, regular set calcined gypsum is used in large amounts for filling the spaces between blocks or slabs of granite and marble while they are being ground and polished with steel shot, emery and rouge. To give best results a fine ground grit-free plaster should be used. For bedding slabs to be cut, a coarse ground calcined gypsum may be used. The plaster slurry, usually mixed with sawdust, is poured between the slabs to present a solid mass through which the saw can cut and to prevent the loss of the sawing shot in the crevices.

Certrock

An extremely dense, hard, strong, calcined gypsum plaster that when mixed with only 40% water will readily pour, filling the most minute details of a mold. When set and dry, casts made from Certrock will have a tensile strength of over 600 lbs. per square inch and a compressive strength of over 5,000 lbs. per square inch. This is

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greater strength than is possessed by concrete as ordinarily made (high grade concrete is usually designed for compression strength of 5,000 lbs. per sq. inch).

Certrock is made by blending carefully weighed amounts of plasticized stucco and other ingredients which reduce the water carrying capacity of the stucco, eliminates air voids, and case hardens the surface of the cast as it dries. It is tested carefully for water carrying capacity and setting time by the plant laboratory.

Fill for Safe Cabinets

Large amounts of calcined gypsum are used in the lining of safes and safe cabinets as a protection against fire. Stucco for this purpose is processed in manufacture to lower the amount of mixing water required and increase the density of the cast. Setting time is regulated to customer requirements.

Shell Loading Filler