AGING AND THE EFFECT OF MIXING PARAMETERS ON MOULD MAKING PROCESSES IN THE CERAMIC INDUSTRY

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Plaster of Paris ($CaSO_4 . \frac{1}{2}H_2O$) is widely used for fabrication of various moulds in the ceramic industry. Sri Lanka's requirements of this material are imported. Very large variations in water demand and mixing characteristics have been found in commercial plasters supplied. These property variations of Plaster of Paris affect the performance of mouldmaking processes in the ceramic industry. The present investigation using, X-Ray Powder Diffraction (XRD) and Technico Torsion Viscometer (TTV) has revealed that the variations in properties of Plaster of Paris could be attributed to the aging condition and storage condition of plaster and also including mixing parameters.

It has been shown that the intitial viscosity and the rate of change in viscosity of the plaster - water mixes can be conveniently determined with a Torsion Viscometer, which provides a sensitive measurement of the water demand and the pouring time of the plaster. Fresh plaster samples invariably shows high water demand and they take several weeks to reach stable reheological properties under atmospheric humidity in normal bagged storage. On the otherhand, a sudden drop in pouring time and setting time, was observed in the samples, which have been exposed to high humidity or prolonged storage period. The effect of mixing parameters such as, plaster - water ratio, mixing time, purity of water on the mould making process are also discussed. The results indicated that the above mixing parameters would greatly influence the setting properties of plaster - water mixtures.

In the present study it has been observed that the proper controll in storage conditions and selecting suitable mixing parameters are of the utmost value in employing plaster material for mould making purposes.