UNIVERSITI TEKNOLOGI MARA

PERFORMANCE AND ANALYSIS OF CERAMIC SLIP ROTARY MOULDING FOR FINE BONE CHINA PRODUCT

NORAZNE BINTI NASIR

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ABSTRACT

One of the method to produce ceramic product is by using slip casting process. However, the process produces waste from the excess slip and takes a long time to complete the process. Alternatively, a new process is being established by combining the traditional slip casting technique and existing polymer rotary moulding concept called Ceramic Slip Rotary Moulding (CSRM). The CSRM machine was developed to control the parameters such as temperature (heating and cooling), time and speed. The CSRM machine is suitable in producing hollow ceramic products especially for ceramic materials such as fine bone china (FBC). FBC is a soft material used for tableware and art ware products due to its brightness and high strength. This research focuses on formulation of ceramic slip for CSRM and preparation of five different particle sizes of FBC measurements (106 µm, 125 µm, 212 µm, 250 µm and 300 µm) to produce FBC product by using CSRM machine. Different particle sizes of the FBC materials were tested and analysed to produce FBC product by controlling the temperature, speed, time and also the weight of the slip to get the best quality of product. The parameter obtained will become the guideline for the overall process and test to produce the best hollow FBC product. Overall process analyses have been established where the temperature was controlled at 90˚C and the speed at 14 rpm. The formulation was successfully produced for the CSRM with solid content of 80% and sufficient green strength achieved was at 1.63 N/mm^2; was able to hold the green body during demoulding and ready for sintering process. Using the new slip formulation of FBC for CSRM process and established process parameters, good quality of FBC hollow product was produced with an average wall thickness of 4mm.

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