INVESTIGATION OF THE PROPERTIES OF REDDISH-NATURAL SAND (FERRUGINOUS SAND) IN SELECTED LOCATIONS OF KATSINA STATE FOR MOULDING OPERATION.

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ABSTRACT
The research investigated the properties of Reddish-natural moulding sand (Ferruginous sand) deposits in Dutsin-Ma and Katsina Local Government areas of Katsina State to find out whether the sand is suitable for foundry applications. The research included chemical analysis, determination of Green and Dry Compressive and Shear Stresses, Refractoriness tests, Sieve analysis as well as Permeability, Compactability and Flowability tests. The chemical analysis showed that Dutsin-Ma sand has 68.50%SiO$_2$ and 16.20%Al$_2$O$_3$ while Katsina sample has 68.60%SiO$_2$ and 19.60%Al$_2$O$_3$. The refractoriness test showed that Katsina sample has higher refractoriness of 1450°C compared to 1400°C for Dutsin-Ma sample. The investigation also obtained Green Compressive Strengths (GCS) of 130.2kN/m$^2$ and 128.2kN/m$^2$ and Dry Compressive Strengths (DCS) of 878.5kN/m$^2$ and 585.7kN/m$^2$ at an optimum moisture content of 4% for Dutsin-Ma and Katsina sands respectively. The Dry Compressive Stress (DCS and Dry Shear Stress (DSS) increase with addition of water content. Green Shear Stress (GSS), however, varied abnormally with increase in water content.