UNIVERSITY OF ILORIN
FACULTY OF ENGINEERING AND TECHNOLOGY

1st FACULTY OF ENGINEERING AND TECHNOLOGY International Conference (FETiCON 2023)

BOOK OF ABSTRACTS

THEME:

ADVANCES AND TECHNOLOGICAL INNOVATIONS IN NATION BUILDING AND ATTAINMENT OF SUSTAINABLE DEVELOPMENT GOALS

SIDE ATTRACTION: TECHNOLOGY EXHIBITION

5th-7th June, 2023

NLNG Building, Faculty of Engineering & Technology,
University of Ilorin, Ilorin, Nigeria.

Table of Contents

Paper 136 – Characterization of Pit Sand Obtained from Selected Locations in The South Western Zone of Nigeria

S. S. Omopariola[1]* and A. A. Jimoh
[1]Civil Engineering Department, Federal Polytechnic, Ilaro,
[2]Civil Engineering Department, University of Ilorin, Ilorin
*Email: samuel.omopariola@federalpolyilaro.edu.ng

ABSTRACT
Sand is about the commonest fine aggregate available in South Western Nigeria. Of the various types of natural sand, pit sand is the most readily available and most widely used. However, not all available Pit – sand is fit for concreting works. This study focusses on the characterization of Pit sand obtained from selected locations across the South Western zone of the Country. From the values obtained the conformity with relevant standards and the suitability for concreting works was determined. Samples of Pit – sand were collected from three different locations from each of the five states in the zone. Sieve analysis test were carried out on all the samples and the values of fineness modulus (FM), coefficient of uniformity (Cu) and coefficient of curvature (Cc) were determined. Other properties considered are specific gravity (SG), water absorption (WA), and percentage silt content (SC). These values were compared with values stipulated in British standards and other relevant literatures. The range of the values of FM, Cu and Cc SG, WA, and SC are 4.16 – 4.68, 2.63 – 10, and 0.53 – 2.56 2.67 – 2.86, 0.67 – 2.04 and 5.4 – 18.18 respectively. Conclusively, while some of the samples are suitable, some are not.

KEYWORDS: Characterization, Pit – Sand, Selected, Locations

Paper 137 – Computational Development and Aerodynamic Analysis of a Single-Stage Launch Vehicle to Subdue Post-Launch Risk

A. Jinadu[1*], A. M. Oluwatofunmi[1], O. A. Olayemi[1], T. Dmytro[2], V. Koloskov[3]

[1]Department of Aeronautical and Astronautical Engineering, Faculty of Engineering, Kwara State University, Kwara State, Nigeria.
[2]Nanjing University of Aeronautics and Astronautics, Nanjing, China.
[3]National University of Civil Defence of Ukraine, Ukraine.
[*]Email: abdulbaqi.jinadu@kwasu.edu.ng

ABSTRACT
The aerospace industry has prioritized reducing fatalities and failure rates after the launch of a vehicle resulting from system or engine failure. Rocketry has been difficult over the years, and international players in the industry are constantly attempting to learn from any failures. This paper aims to decrease material, resource, and payload waste while ensuring crew safety by focusing on the computational modelling and aerodynamic analysis of a single-stage launch vehicle. CATIA V5 was utilized to create the computational model of a triggered nose cone rocket booster while ANSYS was used to analyse the trigger nose cone at different angles of attack and determine how the trigger nose cone will behave in case of emergencies such as system or engine failure, which could lead to the complete explosion of the launch vehicle. Based on the current findings, the trigger nose cone is not in the safe zone when ejected at an angle of attack greater than 20° due to the shockwave's effect on its surface when ejected from the main body of the launch vehicle.

KEYWORDS: Post-launch, Engine failure, Single-stage launch vehicle, Trigger nose cone, Combustion chamber.