



DESIGN AND DEVELOPMENT OF ACCELERATED EROSION TESTING APPARATUS FOR BUILDING MATERIALS

Rahul S¹, Sabareshwaran S², Seema J¹, Shridevi K¹, Sanjaykumar B T¹

¹UG Students, ²Assistant Professor,
Department of Civil Engineering,

Jawaharlal Nehru National College of Engineering, Shivamogga-577204, Karnataka, India.

Email: rahulrahul7795@gmail.com, sabaresh.s@jnmce.ac.in, seemajram@gmail.com,

shridevikeshav@gmail.com, sanjaysanju89@gmail.com

Abstract: The discussion in this paper is part of research directed at establishing accelerated erosion test apparatus for building material. This discussion specifically focuses on strategies that can be used to counter deterioration due to wind-driven rain erosion. The durability of the bricks was assessed using the accelerated erosion test. The different brick specimens were sprayed with water at 1.5kg/cm². The limiting diameter of the pit formed is to be within 1cm for passing this weathering test. Studies have shown a potential for the use of accelerated erosion test apparatus to physical durability.

Keywords: Deterioration, Durability, Erosion test.

1. INTRODUCTION

There is a growing interest in delivering "high performance building" systems. A "high-performance building" is as defined in the Energy Policy Act of 2005 a building that integrates and optimizes all major high performance building attributes, including energy efficiency, durability, life cycle performance, and occupant productivity. Durability is the ability of a physical product to remain functional, without requiring excessive maintenance or repair. Durability of a material is affected by physical and chemical weathering. An accelerated erosion test was conducted to determine the resistance of the building materials to physical weathering. A significant amount of effort has gone into identifying deterioration agents. Factors causing deterioration of building materials can be broadly classified into intrinsic and extrinsic factors. Intrinsic factors are things such as anomalies in the production process that affect the quality of the resulting material. Examples of extrinsic factors include weather elements and any other destructive agents that a building material may be exposed to during service. Environmental factors include climatic and meteorological agents as well as biological and chemical processes that are often compounded by pollutants. Specific

examples of extrinsic factors include precipitation, moisture, temperature, solar radiation, chemical attack and intrusion by organisms. For this research, wind-driven erosion has been identified as one of the main deterioration mechanisms. The poor durability performance and associated short service life of earth-based bricks reduces the sustainable use of the material. The durability of the bricks was therefore assessed on the basis of their resistance to wind-driven rain erosion.

2. MATERIALS

2.1 Motor Pump:

For this test the motor pump having a power rating of 1HP has been used. Voltage range of the pump is 230V. It consists of impeller which is made up of brass. Speed of the pump is around 2000rpm. It includes pump shaft which is made up of carbon steel and extruded aluminium motor body. The dimension of the motor pump is 32*18*25cm and weight is around 8kg.