

## **Title: Development of autoclave aerated concrete (Grade 1&2) using recycled powder from Construction and Demolition Waste (OLP 2604)**

### **Abstract:**

The main concern of the construction sector is construction & demolition waste generation, which quantity is increasing as a result of increasing construction, maintenance, retrofitting, site clearance, natural and manmade disasters and demolition activities worldwide. Meanwhile, the construction sector faces challenges to meet the growing demand for aggregates. As per recent research by the Fredonia group [1], the global demand for construction aggregates is expected to double over the next two decades. Worldwide, extensive research has been conducted on the use of recycled concrete aggregate (RCA)/recycled aggregates (RA) derived from construction and demolition (C&D) waste for the production of concrete/building products, resulting in the successful utilisation of recycled C&D waste (RA/RCA) to a significant extent in many countries. Recycled fines, also referred to as recycled powder (RP), are byproducts generated in C&D waste recycling plants during the production of RA/RCA. Their control, handling, and storage present significant challenges. Day by day, RCA/RA production is increasing worldwide at an exponential rate, and a huge cost will be required for the disposal of RP if no counter plan is formulated for it. Therefore, utilization of RP in construction sector is necessary from the view points of environmental preservation and effective utilization of resources, for instance due to avoid the disposal of wastes and raw materials scarcity, Particularly, in Indian scenario, the utilization of RP in construction sector is limited due to lack of reliable information regarding quantity and quality. lack of awareness, less- availability of recommendation and codal provisions related to usage of RA in concrete/value added products.

Autoclave Aerated Concrete (AAC) is a versatile building material and is being used for various potential applications and benefits, such as, reduction of the dead load of the structure, increasing seismic stability, for thermal and acoustic insulation, minimization of erection process, etc. Due to the inherent porous nature of the AAC, it usually has lower thermal conductivity as compared to normal concrete and clay bricks. AAC can be used to produce blocks, wall panels, floor and roof panels. AAC blocks are generally used for non-load-bearing applications in building construction because of their low density, which ranges between 450-500 kg/m<sup>3</sup>. An effective use of industrial byproducts, such as fly ash (FA), ground-granulated blast-furnace slag, silica fume, etc, for making AAC are well documented, and at the same time, the practical applicability of ACC using such industrial byproducts is currently in progress in the construction sector. Particularly, no documented recommendations/guidelines have yet been reported regarding the RP-based autoclave aerated concrete. Keeping these concerns in view, the proposal is aimed at developing an economically viable methodology for making desirable performance of various grades of RP-based autoclave aerated concrete.

### **Objectives:**

Development of an economically viable methodology for making desirable performance of various grades of Recycled Powder-based Autoclaved Aerated Building Products.

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