

Brief Write Up on Manufacturing of Building Bricks Utilizing Foundry Mould Sand Waste

Waste to Wealth is a research program identified by CSIR, Government of India under the Vertical **Industrial Solids Waste Management**. As part of this theme, the Director, Dr. Prof. A. Ajayaghosh, CSIR-NIIST mooted an idea of effectively utilizing the various Industrial Wastes for the construction applications with an aim to preserve the fast depleting Natural Resources by the construction sectors. Foundry sand waste is a by-product, regularly generated in bulk volume from the metal casting industries and hence an activity on utilization of foundry sand for developing building materials has been seriously considered.

M/s Autokast Ltd is an ISO 9001-2015 certified public sector company under taken by Government of Kerala, and is manufacturing ferrous castings components. The company produces foundry waste sand or spent moulding sand on daily basis and as part of the **Green-Initiative**, the company is keen to transform the foundry waste to Building materials by eco-friendly manner.

CSIR NIIST has systematically studied the reactivity of the foundry sand wastewith cement, lime, gypsum, and polymer modified binders and documented the critical parameters such as strength, density, water absorption properties usually required for building bricks. The continued scientific studies resulted in a process for making bricks through a simple cement bonded compression moulding technique. In this Know-How agreement, the details of the Bricks manufacturing process developed by CSIR NIIST will be transferred to Autokast. CSIR-NIIST joins hands with the company to set-up the brick manufacturing plant and optimize the product quality as per the approved Indian Standards for construction purpose. The plant is designed to utilize nearly 300 tons of sand on daily basis to produce 4000 bricks per day. CSIR NIIST technically assisted to procure the efficient machinery and design the production plant under the funding support from Autokast. The brick products have merits that it completely avoids usage of Natural raw materials like, Natural clays, Sand and Gravel. The cement bonding and compression moulding produces high strength bricks as per the IS 1077 standards. In this process know-How Bricks can also be shaped in aesthetically appealing colors for architectural interior design applications. The project titled, 'House for All', launched by the Central and State Government can directly benefit out of this Bricks making production plant. CSIR NIIST technology is expected to be an environmentally friendly process and help the Life-Mission Project of Govt of Kerala, which is committed to construct homes for nearly 1.6 lakh homeless people in Kerala. The NIIST technology also can be used to make paving tiles, hard aggregates and interlocks.

