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CRI TECHNOLOGY DIGEST



CEMENT
RESEARCH
INSTITUTE
OF INDIA

CRI RICE HUSK
ASH MASONRY
CEMENT-RHAM
Part II

RICE HUSK ASH MASONARY CEMENT—RHAM

Part II

Cement Research Institute of India (CRI) has developed an appropriate technology for the manufacture of RHAM cement as an alternative to OPC for masonry purposes which can fulfill the requirement of binder material for most construction purposes (excepting RCC) particularly in rural sector and to a considerable extent in semiurban areas augmenting the short supply of portland cement by 1-1.5 million tonnes. Various R&D aspects relating to rice husk ash cement, evaluation and application areas of the product have been highlighted in Part I of the technology digest. This technology digest highlights CRI process technology for RHAM cement, technology transfer approach and efforts, product specification and its areas of application.

Process Technology

CRI process for RHAM cement consists in obtaining highly active rice husk under controlled conditions of incineration from specially designed incinerators and mixing it with suitable proportions of treated lime and other modifiers and size reduction to an appropriate level of fineness as indicated in process flow sheet.

Raw Materials

The raw materials, required for rice husk ash masonry cement are:

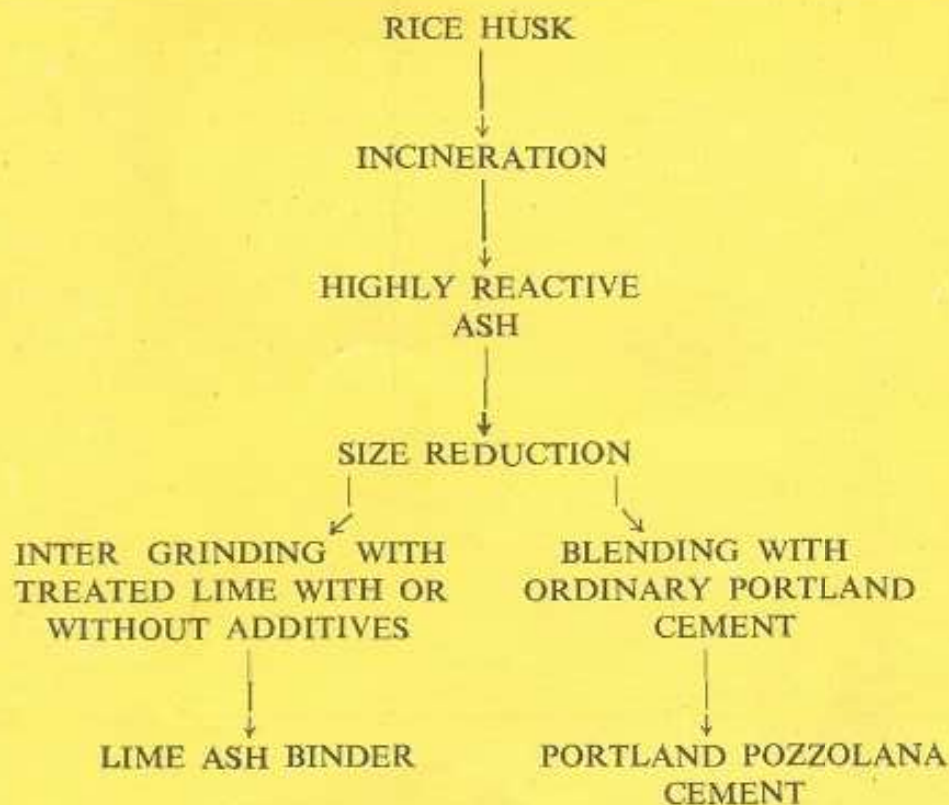
- Rice Husk
- Lime stone
- Coal
- Modifiers

Plant and Machinery

Plant and machinery requirement for the process are minimal which include a set of specially designed incinerators, a lime kiln and a ball mill. Installation of these in the rural sector is not likely to pose any problem of transportation, installation, operation and maintenance.

Product Specifications

RHAM cement is a new product and so far standard methods do not exist for its evaluation. Based upon compositional characteristics the product is being evaluated as per IS : 4098-1967 which has been accepted as a provisional standard for testing of RHAM cement at RCTT second workshop held at Alor Star, Malaysia. RHAM cements produced by CRI technology with and without activators are capable of yielding compressive strengths of the order of 175-180 kg/cm² and 90-95 kg/cm² respectively.



Process flowsheet for RHA based cements



CRI Rice husk Incinerators

Areas of Application

RHAM cement is specifically recommended for following usage:

- brick jointing
- plastering
- drain lining
- well rings
- Foundations, pavement construction etc.

Techno-economic Viability

Based on field experiences a 2 tpd capacity unit based on CRI technology is considered to be economically viable size where there is a rice hulling unit with potentials of processing about 10,000 tonnes of paddy per annum. Subject to the availability of husk, the capacity can be raised to 4 tpd with better cost benefit ratio.

In addition, cost/benefit ratio can be further improved by:

- i) Locating a plant at or very close to rice mill
- ii) Keeping the cost of rice husk low, avoiding transportation and handling to the extent possible
- iii) Association of village cooperative and assistance of cooperative rural banks and other agencies for financial assistance of the project.

Transfer of RHAM Technology

Transfer of technology in commercial stream and establishment of a new product in the market not only calls for a proven technology but all help, guidance expertise, machinery specifications, installation and training facilities for running the production units.

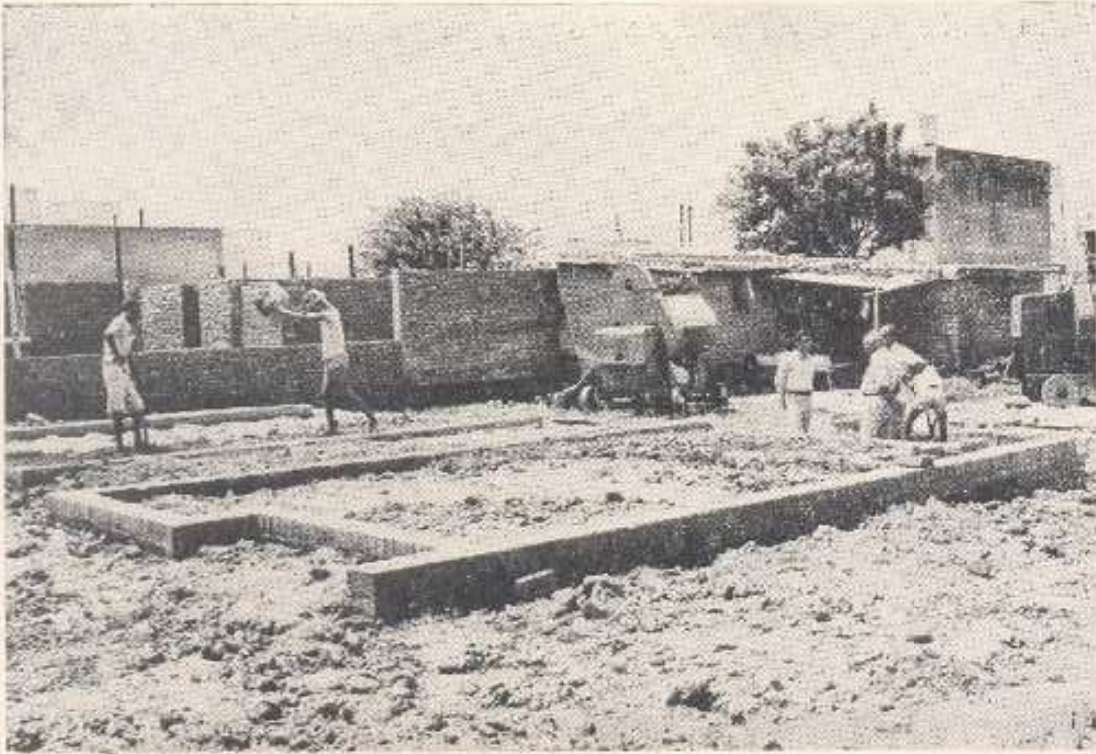
All the above technology transfer aspects relating to RHAM technology have been considered by Cement Research Institute of India and a programme of effective technology utilization has been formulated envisaging setting up of at least 20 RHAM units with 2-4 tpd capacity spread over the country.

The above programme of technology utilization is already under various stages of implementation. Two 2 tpd and one 10 tpd RHAM Cement plants have already been commissioned and are producing consistently good and uniform quality cement conforming to LP 40 of IS : 4098-1967, the performance characteristics of the product are considerably superior to LP 40 grade. In addition work has been taken up for establishment of another six RHAM units and is at various stages of implementation.

Other aspects of technology utilization include formulation of specification and code of practice for RHAM cement which are also receiving attention of CRI.

Scope of establishing RHAM Cement Plant in India

Commercialization and utilization of RHAM cement technology in rural sector demands Development & promotion of technology to rice



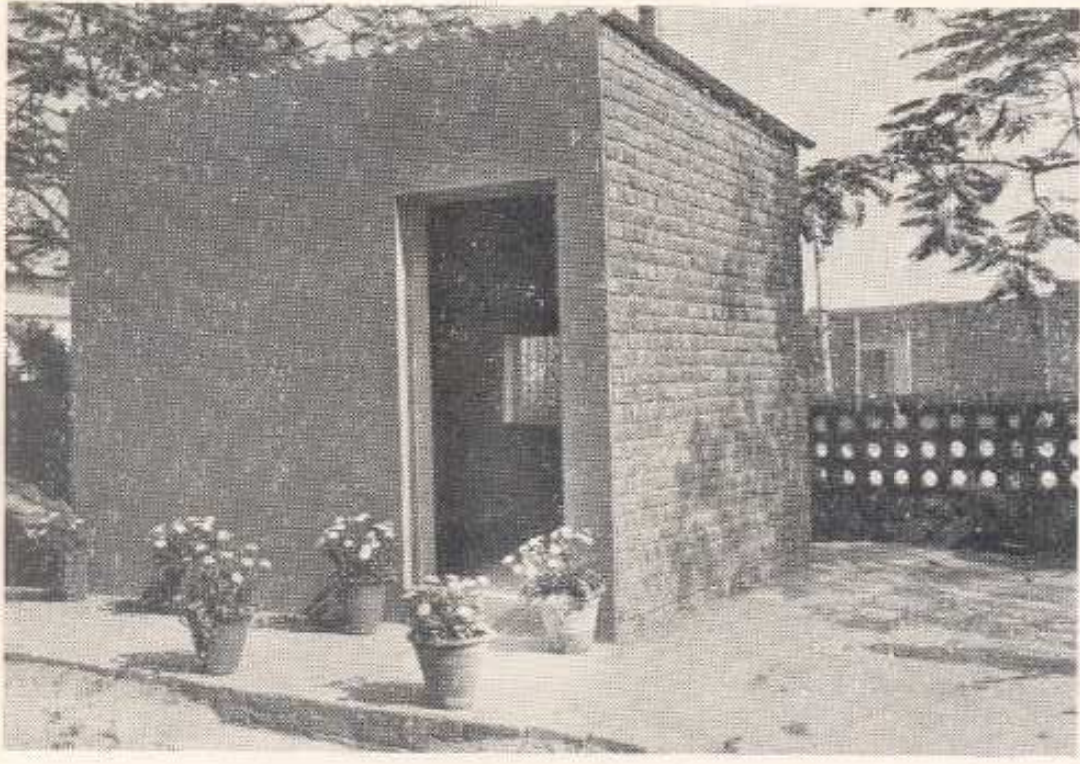
General view of a Building coming up with RICEM Cement

cultivation areas in the form of either demonstration-cum-production-cum-training units in the initial stages which result into spreading of technology without much incentives.

Survey and analysis carried out by CRI have indicated that in all intensive rice cultivation areas there are centres of processing paddy which on an average process 10,000 tonnes of paddy per year. Thus there is good scope for producing rice husk cement on small scale plants of 2-4 tpd capacity. The number and capacity of these plants will depend on the availability of husk.

Advantages of RHAM Cement Plants

- i) Effective disposal of agricultural waste and its utilization
- ii) Increased availability of cementitious materials thereby conserving the ordinary portland cement to that extent



Brick masonry & plastering work with RHAM Cement

- iii) Uplifting rural economy and development
- iv) Generation of employment potential in rural sector
- v) Lower capital investment and low gestation period

Incentives Available

Government of India, vide its Press Notification No: 14/79-CE dated 27 January 1979 has offered total excise exemption for cement obtained by fine grinding of paddy husk ash and hydrated lime and an additive under item No. 23.

Financial Assistance

Entrepreneurs need to get in touch with National Small Industries Corporation and its subsidiaries, state financial corporations,

state small scale industrial development corporations etc. for the term loans and with the commercial banks for short term loans.

Assistance from CRI

CRI is now in the process of releasing the know-how on specific terms and conditions to the interested entrepreneurs on turn key basis.

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