



Outreach & Dissemination Services Office CSIR – Central Building Research Institute Roorkee–247667 (UK)

Skill Development Training Programme on Design, Construction and Systematic Operation of High Draught Brick Kilns June 09, 2024 (Lucknow)

A one-day skill development program focused on 'Design, Construction and Systematic Operation of High Draught Brick Kilns' was organized under the aegis of CSIR Integrated Skill Initiative by CSIR – Central Building Research Institute, Roorkee on June 09, 2024 at Lineage Hotel Lucknow. Around 150 participants from 19 different District of Uttar Pradesh participated in the program. Sh. Pawan Singh MLC, Sitapur (UP) inaugurated the training program. Dr. Neeraj Jain and Dr. Soumitra Maiti delivered lectures/presentation on key issues and challenges of the burnt clay brick industry in the country, Soil quality, testing, and preparation for making green bricks, Systematic operating procedure of high draught brick kiln. In the inaugural speech, Sh Nadeem Ahmad informed the participant about different R&D activities of CSIR-CBRI specially related to development of cost effective and pollution free brick kilns and technology.

The brick kiln industry plays an essential role in our society, providing the fundamental building blocks for infrastructure and construction projects world wide. However, it is crucial to acknowledge the adverse effects that traditional brick kilns can have on our environment, air quality, and public health. The emissions of pollutants such as particulate matter, sulfur dioxide, nitrogen oxides, and black carbon from brick kilns contribute significantly to air pollution and climate change. The share of energy in total cost of brick production is 35-50 %. Central Pollution Control Board (CPCB) has recognized the brick industry as a highly resource & energy intensive besides one of the most polluting industry. The large coal consumption of the brick industry is the cause of significant air pollution in terms of carbon dioxide (CO₂), carbon monoxide (CO), sulphur dioxide (SO₂), nitrogen oxides (NO_x) and suspended particulate matter (SPM).

As per MoEF& CC notification dated 22.2.2022, all the existing and new brick kilns will be operated on zig-zag technology or vertical shaft or use Piped Natural Gas as fuel in brick making. Further, they will comply SPM emission standard of 250 mg/Nm³ at 4 % CO₂ normalization. All brick kilns shall use only approved fuel such as Piped Natural Gas, coal, fire wood and/or agricultural residues. However, in Delhi-NCR, use of coal has been banned by CAQM w.e.f. 1.1.2023 for industrial use including brick kilns even after adopting the zig-zag technology. At present the major issues faced by brick industry are as under:

- Brick kiln industry is an un-organized industry
- High dependency on coal-a natural resource, as major source of major fuel
- Excessive use of top fertile layer of soil-a natural resource for brick making
- High dependency on labor for making green bricks and firing

- Untrained manpower for firing of bricks
- Non adoption of systematic procedures for operation and firing practices
- Lack of mechanization facilities for making green bricks
- High specific energy consumption (SEC) for baking bricks
- High emission of SPM and green house gases
- Incomplete combustion of coal due to entry of secondary air in the kiln
- Ban on coal based industries including brick kilns in Delhi-NCR and adjoining areas
- Use of loose biomass (mustard husk) for baking of green bricks in the kiln
- Use of illegal fuels like black carbon, tires, plastic etc. as fuel in the kiln
- Non availability of biomass pallets having uniform calorific value and their use
- Non availability of clean fuel based design of brick kiln
- Non availability of PNG/LNG gas pipeline at brick kiln sites
- High fugitive emission
- Reluctance of brick kiln owners in adopting advance technologies due to high cost

To find out the solutions of various issues and challenges associated with brick kiln industry, there is an urgent need to demonstrate large scale and positive environmental impact in brick making clusters. Keeping in view all the issues, the program was designed to find out the ways and means by which sustenance of brick kilns activities may be viable. Through this program, pollution challenges faced by the brick kiln sector were identified and innovative strategies to mitigate their impact were explored. The major objective of the program was to create a roadmap for a cleaner and greener future in the brick kiln sector.

During program, 06 lectures were given by a team of experts in 03 technical sessions. 150 participants (brick kiln owners) from different District of Uttar Pradesh participated in this training program. Lectures on design, quality construction, systematic operation procedures & energy efficiency of high draught brick kiln, use of internal fuel, soil quality, etc. were delivered. It is expected that after attending this training program, brick kiln owners will improve their manufacturing practices to save the natural resources and environment.

In the concluding session of said program, brick kiln owners and operators/representatives given their feedback and appreciated the efforts made by CSIR-CBRI to organize such important event for the brick kilns users/Industries and the society.



Glimpses of the Training Programme