IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.301
Volume 3, Issue 2, December 2023

Reduction of Environmental Pollution and Soil Conservation in Indian Brick Sector: A Guiding Step for Small Scale Production

Raut Padmakar T[1] and Patil Jaypal K[2]
Asst. Prof., Department of Mechanical Engineering
Bharati Vidyapeeth Institute of Technology, Navi Mumbai, India[1]
Vice-Principal, Bharati Vidyapeeth Institute of Technology, Navi Mumbai, India[2]

Abstract: *Bricks are extensively used building material all over the world due to their low price, frequent availability and ease of handling. There are more than 150,000 brick kilns in India producing about 300 billon bricks annually, employing about 18 million workers and consuming about 40 million tons of coal annually. It is also estimated that the clay fired brick sector in India is estimated to consume as high as 800 million tons of clay annually [1]. The main focus is on the red brick because it is a low maintenance, permanent, durable building material that won't rot rust, burn, corrode, decay, or encourage mold growth. Also these bricks are fire resistant and easily reusable. However, as a matter of fact, they also consume huge quantity of clay. Thus, there is an urgency to conserve the top soil and to reduce the environmental pollution produced by it. Adding waste material to the clay can be an alternative because it reduces the consumption of clay and also proper utilization of waste can be achieved, thus, reducing the environmental pollution. This paper presents the comparative study of different samples of bricks produced by replacing some proportion of clay with the waste materials. Different types of wastes and additives are used as partial replacement of fresh clay. The bricks prepared by incorporating the waste materials are analyzed for their physical, chemical and mechanical properties and the results are compared with those obtained from the control samples. The brick specimen is evaluated for their compressive strength, water absorption, thermal conductivity, efflorescence, baking temperature, etc.*

Keywords: Red clay brick, environmental pollution, top soil, brick industry, small scale production

REFERENCES

[1]. A. Khitab, Materials of Construction, Allied Books, 2018.
[2]. G.H.M.J.S. De Silva, M.L.C. Surangi, Effect of waste rice husk ash on structural, thermal and run-off properties of clay roof tiles, Constr. Build. Mater. 154 (2017) 251–257. doi:10.1016/j.conbuildmat.2017.07.
[3]. D. Eliche-Quesada, M.A. Felipe-Sesé, J.A. Lopez Perez, A. Infantes-Molina, Characterization and evaluation of rice husk ash and wood ash in sustainable clay matrix bricks, Ceram. Int. 43 (2017) 463–475. doi:10.1016/j.ceramint.2016.09.181.
[4]. L. Concrete, Properties of clay-sand-rice husk ash mixed bricks, 9 (1987) 105–108.
[5]. V. Jiménez-Quero, O.T. Maza-Ignacio, J. Guerrero-Paz, and K. CamposVenegas, Industrial wastes as alternative raw materials to produce eco-friendly fired bricks, in: VIII Int. Congr. Eng. Phys., 2017: pp. 1–6. doi:10.1088/1742-6596/792/1/012065.
[6]. S. Abbas, M.A. Saleem, S.M.S. Kazmi, M.J. Munir, Production of sustainable clay bricks using waste fly ash : Mechanical and durability properties, Elsevier Ltd, 2017. doi:10.1016/j.jobe.2017.09.008.
[7]. D. Eliche-Quesada, M.A. Felipe-Sesé, J.A. Lopez Perez, A. Infantes-Molina, Characterization and evaluation of rice husk ash and wood ash in sustainable clay matrix bricks, Ceram. Int. 43 (2017) 463–475. doi:10.1016/j.ceramint.2016.09.181.
[8]. D. Eliche-Quesada, M.A. Felipe-Sesé, A. Infantes-Molina, Olive Stone Ash as Secondary Raw Material for Fired Clay Bricks, Adv. Mater. Sci. Eng. 2016 (2016) 1–9. doi:10.1155/2016/8219437

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.301
Volume 3, Issue 2, December 2023

[9]. H. Binici, O. Aksogan, M.N. Bodur, E. Akca, S. Kapur, Thermal isolation and mechanical properties of fibre reinforced mud bricks as wall materials, Constr. Build. Mater. 21 (2007) 901–906. doi:10.1016/j.conbuildmat.2005.11.004.

[10]. S.M.S. Kazmi, S. Abbas, M.A. Saleem, M.J. Munir, A. Khitab, Manufacturing of sustainable clay bricks: Utilization of waste sugarcane bagasse and rice husk ashes, Constr. Build. Mater. 120 (2016) 29–41. doi:10.1016/j.conbuildmat.2016.05.084.

[11]. A.A. Kadir, M.I.H. Hassan, N.A. Sarani, A.S. Abdul Rahim, N. Ismail, Physical and mechanical properties of quarry dust wasteincorporated into fired clay brick, AIP Conf. Proc. 1835 (2017). doi:10.1063/1.4981862.

[12] E.A. Domlnguez, R. Ullmann, Ecological bricks made with clays and steel dust pollutants, 11 (1996) 237–249.

[13]. M. Sutcu, S. Akkurt, The use of recycled paper processing residues in making porous brick with reduced thermal conductivity, Ceram. Int. 35 (2009) 2625–2631. doi:10.1016/j.ceramint.2009.02.027.

[14]. Applied Clay Science The use of different forms of waste in the manufacture of ceramic bricks, Appl. Clay Sci. 52 (2011) 270–276. doi:10.1016/j.clay.2011.03.003.