THE USE OF LANDFILL WASTE IN THE MANUFACTURE OF CLAY BRICKS

By

Kamilia Ahmed Kamal Mohamed El–Nagar

A Thesis Submitted to the
Faculty of Engineering at Cairo University
in Partial Fulfillment of the
Requirements for the Degree of
MASTER OF SCIENCE
in
Chemical Engineering

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Under the Supervision of

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Title of Thesis:

The use of landfill waste in the manufacture of clay bricks

Key Words: Landfill – Waste Recycling – Fired Clay Bricks – Standards of Building Bricks

Summary:

In the present thesis, it is tried to utilize landfill waste in the manufacture of fired clay bricks. The raw materials were characterized. Mixtures were prepared, where the waste was added to the clay in different percentages. The brick specimens for each mixture were molded, dried, and then fired. It is found that the replacement of 10 wt. % of the Egyptian clay as a raw material in fired clay brick industry by the landfill waste fired at 800 °C, is recommended for its environmental and economical benefits, in addition to its improvement of brick quality.

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List of Symbols

Symbols

XRF	X–Ray Flourecence.
XRD	X–Ray Diffraction.
DTA	Differential Thermal Analysis.
TGA	Thermo – Gravimetry Analysis.
SEM	Scanning Electron Microscope.
FS	Free Silica.
OM	Organic Matter.
CEC	Cation Exchange Capacity.
SSA	Specific Surface Area.
ρ_S	Powder Density.
C	Compressive Strength.
LOI	Loss on Ignition.
P	Apparent Porosity.
ρ_b	Bulk Density.
WA	Water Absorption.
SW	Severe Weathering.
MW	Moderate Weathering.
NW	Negligible or No Weathering.