

PRELIMINARY CONTROL TECHNOLOGY ASSESSMENT

OF

Louisville Fire Brick Company
Grahn, Kentucky

REPORT WRITTEN BY:

Frank W. Godbey
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NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH
Division of Physical Sciences and Engineering
Engineering Control Technology Branch
4676 Columbia Parkway
Cincinnati, Ohio 45226

Place Visited: Louisville Fire Brick Company
Grahn, Kentucky

Date of Visit: September 20, 1982

Survey Team: Frank W. Godbey

Employer Representative: C. W. Stevens, Vice President

Employee Representative: Donald Frazier
President of Local 857
Aluminum, Brick and Glass Workers
International Union, AFL-CIO, CLC

Standard Industrial
Classification (SIC CODE): 3255 - Clay Refractories

Purpose of Survey: To perform a preliminary assessment of the
methods used in controlling potential health
hazards in the manufacture of fire brick and
to determine the advisability of conducting an
indepth survey of this plant.

INTRODUCTION

The manufacture of refractory bricks involves worker exposure to a variety of potentially harmful chemical and physical agents. Some of the agents of concern are: silica, temperature extremes, and noise. Our literature review and contacts with people in the refractory brick manufacturing industry indicates that there is control technology in place in the industry to prevent the over exposure of workers to these agents.

The Engineering Control Technology Branch of the Division of Physical Sciences and Engineering, NIOSH, is conducting a research study to assess and document the control technology being used to minimize worker exposure in the ceramics industry. Exposures to the above mentioned harmful chemical and physical agents have been documented as a cause of a variety of health problems. This walk-through survey was conducted to obtain information on the use of health control technology when manufacturing refractory bricks and to determine the advisability of conducting an indepth survey of this plant.

The primary contact was the company's Vice President, C. W. Stevens. During our walk-through survey, we met briefly with other management personnel and talked to a number of personnel physically involved in the manufacture of refractory bricks.

PLANT DESCRIPTION

Louisville Fire Brick Company produces approximately 10,000 fire bricks by dry press machines and 2,000 handmade fire brick shapes each 8 hour workshift from locally-mined flint and semi-flint clays. The Company employs 35 workers on an incentive pay system and operates one shift each day, five days a week. The plant area occupies about five acres and consists of a small brick office building, a sheet metal maintenance building, and a sheet metal production building of approximately 20,000 square feet. In addition, there are several periodic kilns, storage bins, and raw materials receiving and storage area.

PROCESS DESCRIPTION

Locally mined fireclays consisting of hard flint clay and soft semi-flint clay with a chemical analysis range of 51-56% silica, 36-41% alumina, 2.3-2.4% iron oxide, 3.1-3.4% titania, 0.14% lime, 0.61-0.75% magnesia and 1.3-1.5% alkalies are brought by truck to the plant raw materials storage area. These raw clays along with salvaged brick waste are crushed in a roll crusher and transported by conveyor belt to a pan feeder where they are mixed and fed to a dry pan for final grinding. The dry pan is similar to a grist mill but has a perforated bottom through which the crushed material is continuously removed. The material is ground to 12-20 mesh and fed to heated vibrating screens where the finely ground material passes through the screens to steel storage bins and the over-sized material is returned to the dry pan for further size reduction. The finished raw

materials are blended with 2-6% water in a rotary mixer and the blend fed to a hydraulic press where the standard refractory shapes are formed.

Oversize and nonstandard shapes are hand formed. The shapes are placed on pallets and allowed to dry in a drying room before being transported by forktruck to periodic kilns (beehive) for firing. The shapes are fired for 5-1/2 days at about 2400°F before being stored or shipped by truck to the consumer.

HEALTH AND SAFETY PROGRAM

The health and safety program is conducted by a union-management committee that performs periodic inspections of the plant operations. The personal protective equipment program includes 100 per cent use of hard hats and safety shoes and eye protection where indicated. Liberty Mutual Insurance Company, the Company's Worker's Compensation insurance carrier, performs periodic health and safety inspections of the plant and provides the Company with written comments. Health and safety posters are displayed throughout the plant.

CONTROLS

There are no specific engineering controls employed in this operation, such as ventilation systems. The Company's personal protective equipment program appears to be effective for head, foot, and eye protection.

CONCLUSIONS/RECOMMENDATIONS

The Louisville Fire Brick Company is not recommended for an indepth study since it does not have any unique state-of-the-art controls.