

INDUSTRIAL HYGIENE SURVEY OF THE

Triangle Brick Company  
Durham, N.C.

SURVEY DATE  
August 4-8, 1975

SURVEY CONDUCTED BY  
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REPORT WRITTEN BY  
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DATE OF REPORT  
February 3, 1976

Environmental Investigations Branch  
Division of Field Studies and Clinical Investigations  
National Institute for Occupational Safety and Health  
Cincinnati, Ohio

PLACE OF VISIT:

Triangle Brick  
Route 4, Box 60  
Durham, North Carolina  
27703

DATE OF VISIT:

August 4-8, 1975

PERSONS CONTACTED:

Edward Tysinger - Plant Manager

PURPOSE OF VISIT:

Acquire data for inclusion in a  
comprehensive study of North  
Carolina's Brick Industry.

## INTRODUCTION

The Division of Field Studies and Clinical Investigations, of the National Institute for Occupational Safety and Health, was requested to investigate the potential for silica exposure in the North Carolina Brick Industry. Triangle Brick was one of the plants selected for study as being representative of this industry.

During the week of August 4-8, 1975, the Medical Investigations Branch, assisted by the Environmental Investigations Branch, collected data representative of Triangle Bricks 100 nonunionized blue collar workers.

The plant is located on 500 acres and consists of 5 buildings. The plant was built about 40 years ago. The operation is carried out by one main shift 5 days/week with skeleton crews on the kiln 24 hrs./day, 7 days/week.

## PROCESS

The shale is mined about one mile from the plant and conveyed by truck to the coarse grinding area. Here the material is broken into small chunks and conveyed via open endless belts to a storage area prior to final grinding and screening. The finely ground material is stored in hoppers before being sent to a pug mill, where it is mixed with water and extruded. After extrusion facing material, such as  $MnO_2$ , wood, flour or sand, is added by hand and the green brick are cut by a wire cutter before loading on to kiln cars and being fired in a tunnel kiln.

## SURVEY PROCEDURES AND RESULTS

Since a complete Industrial Hygiene Survey had already been done on Triangle Brick, Environmental Investigation assignment at this time was to collect only air samples for acute exposure testing and to assist Medical Investigations in collecting information for development of test methods for the medical aspects of the study.

Personal respirable samples were collected on 12 individuals who will be tested for the effects of acute exposure to silica. The respirable samples were collected by means of dampened MSA personal pumps, 10 mm cyclones and 5 micron pore size 37 mm PVC filters. The sampling time was about 6 hours. The persons sampled were selected as being representative of the various operations.

The threshold limit value based on the average percentage of silica (9.1%) in the dust is  $0.89 \text{ mg/m}^3$  of dust. The following values were found at Triangle Brick.

<u>AREAS</u>	<u>mg/m<sup>3</sup> dust</u>	<u>% TLV</u>	<u>mg/m<sup>3</sup> SiO<sub>2</sub></u>
Mixing of facing material	0.98	110.11	.089
Mixing of facing	0.82	92.13	.074
Yard Crew	0.26	29.21	.006
Hacking	0.64	71.91	.058
Stacker	0.24	26.97	.022
Grinding	0.27	33.34	.025
Mixing of facing material	0.95	106.74	.086
Strapping	0.81	91.01	.074
Hacking	0.35	39.33	.032
Unloading cars	1.78	200.00	.162
Forklift	0.00	0.00	.000
Making room	0.26	29.21	.024

#### RECOMMENDATIONS AND CONCLUSIONS

This plant has a nuisance dust problem which could be minimized by improving the material transport system so that dust would not sift off the belts, enclosing the transfer points and separating dusty operations from non-dusty operations. The area that appears to produce the most dust is the mixing area, where much hand work is done. Thought should be given to the installation of a large open hood with slot type ventilation which would pull air away from the work area.

In spite of the dusty conditions observed in the plant, of the twelve air samples collected only three showed values above the current TLV for free silica; that is 110, 107, and 200%. Surprisingly unloading cars (dehacking) showed the highest value.

It would appear that a long range plan with the idea of correcting the worst areas as described above should be the first leading to the correction of the dust problem.