

PRELIMINARY SURVEY REPORT:  
CONTROL TECHNOLOGY FOR THE CERAMICS INDUSTRY

AT

American Standard Corporation  
Wauregan, Connecticut

REPORT WRITTEN BY:  
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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

PLANT SURVEYED: American Standard Corporation  
Wauregan, Connecticut

SIC CODE: 3261 - Vitreous China Plumbing  
Fixtures

SURVEY DATE: July 19, 1982

SURVEY CONDUCTED BY: Frank W. Godbey

EMPLOYER REPRESENTATIVES CONTACTED: William Casagrande, Manager,  
Industrial Relations  
C. W. Amoss, Division Safety  
Director  
Tom Davis, Plant Manager  
Abraham Pineles, Plant Ceramic  
Engineer  
Gene Bissonnette, Plant Engineer

EMPLOYEE REPRESENTATIVES CONTACTED: Bill Denome, Union President  
Ed Sylvester, Union Vice President  
Carol Snow, Union Recording Secretary

PURPOSE OF SURVEY: To perform a preliminary assessment  
of the methods used in controlling  
potential health hazards in the  
manufacture of vitreous china  
plumbing fixtures and to determine  
the advisability of conducting an  
in-depth survey of this plant.

## I. INTRODUCTION

The National Institute for Occupational Safety and Health (NIOSH) is the primary Federal agency engaged in occupational safety and health research. Located in the Department of Health and Human Services (formerly DHEW), it was established by the Occupational Safety and Health Act of 1970. This legislation mandated NIOSH to conduct a number of research and education programs separate from the standard setting and enforcement functions carried out by the Occupational Safety and Health Administration (OSHA) in the Department of Labor. An important area of NIOSH research deals with methods for controlling occupational exposure to potential chemical and physical hazards. The Engineering Control Technology Branch (ECTB) of the Division of Physical Sciences and Engineering has been given the lead within NIOSH to study the engineering aspects of health hazard prevention and control.

Since 1976, ECTB has conducted a number of assessments of health hazard control technology on the basis of industry, common industrial process, or specific control techniques. Examples of these completed studies include the foundry industry; various chemical manufacturing or processing operations; spray painting; and the recirculation of exhaust air. The objective of each of these studies has been to document and evaluate effective control techniques for potential health hazards in the industry or process of interest, and to create a more general awareness of the need for or availability of an effective system of hazard control measures.

These studies involve a number of steps or phases. Initially, a series of walk-through surveys is conducted to select plants or processes with effective and potentially transferable control concepts or techniques. Next, in-depth surveys are conducted to determine both the control parameters and the effectiveness of these controls. The reports from these in-depth surveys are then used as a basis for preparing technical reports and journal articles on effective hazard control measures. Ultimately, the information from these research activities builds the data base of publicly available information on hazard control techniques for use by health professionals who are responsible for preventing occupational illness and injury.

The manufacture of vitreous china plumbing fixtures (sinks, urinals, bowls, etc.) involves worker exposure to a variety of potentially harmful chemical and physical agents. Some of the agents of concern are; silica, numerous color additives, temperature extremes, and noise. Our literature review and contacts with people in the vitreous china plumbing fixtures manufacturing industry indicates that there is control technology in place in the industry to prevent the overexposure 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 vitreous china plumbing fixtures and to determine the advisability of conducting an in-depth survey of this plant.

The primary contact was the company's Safety Director, C. W. Amoss. 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 vitreous china plumbing fixtures.

## II. PLANT AND PROCESS DESCRIPTION

### PLANT DESCRIPTION

American Standard Corporation, Plainfield Plant, produces vitreous china plumbing fixtures (sinks, urinals, bowls, etc.) from ball and china clays, flint, and feldspar. The company employs 400 workers and operates two shifts each day, five days a week. The plant area occupies about 20 acres and consists of one 25-year-old brick and sheet metal office and production building of approximately 400,000 square feet.

### PROCESS DESCRIPTION

Georgia china clay (kaolin), Tennessee ball clay, flint, and feldspar, ground to production specifications, are transported by rail to the plant raw material storage area and dumped into specified silos. These raw materials are fed from the storage silos into a battery-powered scale vehicle and transported to the mixing area. They are dumped into a blunger (mixer) where they are blended with water to produce slip. The blended slip is pumped up to vibrating shaker screens where it is classified and allowed to flow by gravity into holding tanks. The classified slip flows to the casting bench where it is poured into plaster-of-paris molds and allowed to harden. The hardened cast is removed from the mold and automatically and manually fettled (scraped and wet-sponged) to produce a finished cast. The finished cast is placed on carts and automatically transported through tunnel dryers for 24 hours of drying. The dried cast is manually placed on conveyors and transported through water-fall booths for automatic and manual glaze spraying. The glazed cast is manually placed on kiln cars and transported by rail into a tunnel kiln for 24 hours of firing at approximately 2,300°F. Defective casts are scrapped or sent for rework/repair (grinding, patching) before being sent to rework glaze spray booths for glaze spraying and refire. The finished product is inspected, packed, and shipped by truck to the consumer.

### HEALTH AND SAFETY PROGRAM

The health and safety program is conducted by the Division Safety Director who performs periodic health and safety inspections of the plant operations. He also conducts periodic industrial hygiene sampling of selected operations and holds health and safety training sessions for employees. The personal protective equipment program includes use of safety shoes, safety glasses, ear protection, and respirators in designated areas.

### III. CONTROLS

#### PRINCIPLES OF CONTROL

Occupational exposures can be controlled by the application of a number of well-known principles, including engineering measures, work practices, personal protection, and monitoring. These principles may be applied at or near the hazard source, to the general workplace environment, or at the point of occupational exposure to individuals. Controls applied at the source of the hazard, including engineering measures (material substitution, process/equipment modification, isolation or automation, local ventilation) and work practices, are generally the preferred and most effective means of control both in terms of occupational and environmental concerns. Controls which may be applied to hazards that have escaped into the workplace environment include dilution ventilation, dust suppression, and housekeeping. Control measures may also be applied near individual workers, including the use of remote control rooms, isolation booths, supplied-air cabs, work practices, and personal protective equipment.

In general, a system comprised of the above control measures is required to provide worker protection under normal operating conditions as well as under conditions of process upset, failure and/or maintenance. Process and workplace monitoring devices, personal exposure monitoring, and medical monitoring are important mechanisms for providing feedback concerning effectiveness of the controls in use. Ongoing monitoring and maintenance of controls to insure proper use and operating conditions, and the education and commitment of both workers and management to occupational health are also important ingredients of a complete, effective, and durable control system.

These principles of control apply to all situations, but their optimum application varies from case-to-case. The application of these principles are discussed below.

The company has installed local exhaust ventilation systems at the silo discharge area, in the finishing area, in the glaze spray booths, and in the rework/repair area that appear to be effective in protecting potentially exposed employees.

#### IV. CONCLUSIONS AND RECOMMENDATIONS

Although the American Standard Corporation has many controls that appear to be effective, they are not recommended for an in-depth study since they do not have the operation (raw material crushing and grinding) being studied in this project.