

REPORT

**Present Health Hazard in Glass Industries
at Firozabad, U.P., India**

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Glass industries at Firozabad district are completely non-mechanical, age-old, traditionally cottage and household industries. A detailed study of the processes used here and health hazards along with recommendations to encounter these issues have been systematically dealt with in this report.

The district of Firozabad is situated between 27° – $27^{\circ}24'$ north latitude and $70^{\circ}60'$ and $70^{\circ}04'$ east longitude in the south-western corner of Uttar Pradesh. It is situated at about 30 km east of Agra district. It is bound by Etah District in the north, Etawa Distt. in the east and Mainpuri District in the south. The district comprises of an area of 2,30,750 ha. The total population of the district is 12,60,265 of which 9,53,319 resides in rural area and 3,06,946 in urban area. The National Highway no. 2 passes through the heart of the district connecting it with other important cities in the country.

Though the factories are scattered all over the city, but they are mainly spread up to 15–20 km of Firozabad in rural areas till Shikohabad. The industries are located in south-west, south-east and southern part of the town. Two types of glass units are established in Firozabad: glass bangles and glasswares. The glass bangle industry shows a more rapid growth pattern than glasswares industry by 50% increase. The glass bangle industries can be grouped under the following three groups:

1. The glass blowing factories with 600–1200 workers and total capital investment Rs. 25–50 lakhs.
2. Glass bangle units in which the average number of workers employed is 200 and capital investment is about 10–25 lakhs of rupees. These are the main industrial units of the city.
3. Glass bangle units in which the total capital investment is less than 4 lakhs and the average number of workers employed is 50. These units produce decorative items but are much less in number.

At present there are 300 registered units in the Firozabad district engaged in the manufacture of glass and ceramics. These comprise of 158 glass bangle units, 40 block glass making units, 5 units making glasswares, 19 units manufacturing glass shades and 32 units engaged in the manufacture of pottery, ceramics and refractories.

Types of technology in glass industry

Glass is essentially a super cooled liquid. Glass consists of compounds of silicates with alkaline and alkaline-earth oxides and the raw materials for glass manufacture are still (as they were in ancient times) sand, soda and limestone. Though there are many recipes for making glass, one common method followed in Firozabad is as below:

Raw Materials

59 parts of quartz sand, 17 parts of soda, 15 parts of quartz, 4.5 parts of limestone, 3 parts of sodium sulphate and carbon and 1.5 parts of feldspar along with cullets (broken waste glass as flux).

Process

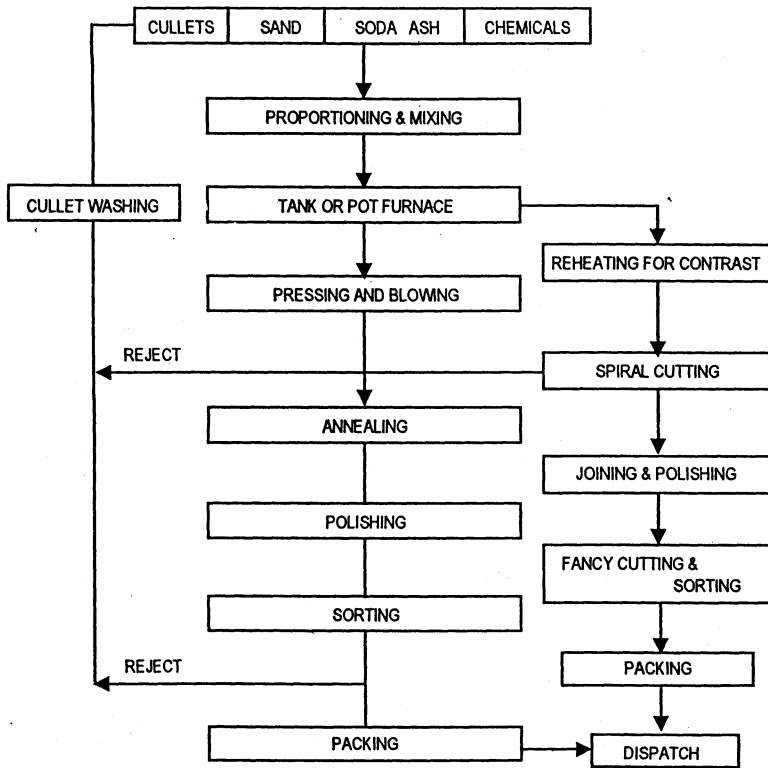
The following points are important from the viewpoint of environmental and health hazards in the manufacturing process of glassware and glass bangles:

1. The workers mix the unconsolidated raw materials by manual methods at extreme risk of inhalation of toxic substances as they do not wear any mask of any type.
2. The workers are exposed to high temperature, coal ash and smoke, with the result that they suffer from bronchial diseases. Furnaces with low chimneys also create environmental problems for neighbouring residential areas.
3. The workers (semi-skilled) collect molten glass from the furnace on rods and move around to the moulds and presses. The moulds and presses are placed close together in a cramped environment and there is danger of accidents due to physical contact with hot glass rods and flying glass pieces.
4. The persons involved in glass blowing also run the risk of lung damage and burns by inhalation of hot air.
5. In glass bangle industry the work of *judaiya* (i.e., joining of cut bangles) is most hazardous as the workers are exposed to fumes of kerosene lamps placed in closed non-ventilated rooms. This work of *jurai* is mostly done by female workers.

Health implications of the industry

Apart from being scorched as a matter of course, the workers involved in the glass industry also inhale silica and carbon dust leading to asthma, bronchial spasms and a host of other respiratory diseases. Further, Firozabad has the highest incidence of tuberculosis in U.P. due to the constant inhalation of foreign particles. Doctors confirm that workers develop skin diseases like eczema after working within the close confines of both home and workplace. Their eyesight is strained from looking continuously into the blinding bright light of furnaces, and they get burns, abrasions and cuts from handling labias in a limited space.

What worries workers more than all this, however, is the possibility of suffering from heat stroke, exhaustion and the loss of salts through perspiration.



* Indicates the bangle manufacturing process

In this uniformly depressing scenario, the plight of women is worse. Firozabad is full of women patients.

According to a survey¹ five to ten years of exposure to an average heat of 55°C everyday can lead to cancer. At the simplest fatigue, chronic anaemia, retardation of growth, muscle cramps, irritability and a general feeling of ill health are the outcomes of this kind of exposure. Most workers employed in these glass factories for over five years have, in fact, complained of these symptoms.

Recommendations

The efforts through this study have been concentrated on the identification of major problems concerning the glass industries at Firozabad and formulation of policy recommendations to encounter these issues. Hence, the following proposals are formulated:

1. Subsidies and incentives should be given to the glass unit owners in the form of provision of coal and other infrastructural facilities like power and fuel subsidy, technical assistance to entrepreneurs, etc.
2. Revitalising Government Undertakings for the purpose of:
 - (a) Propagation of sophisticated modern technology for industrial process,

combined with efforts to maintain employment potential by enhanced production and diversification into export market.

- (b) Precautionary measures and pollution control services etc. for safety of workers as well as environment:
3. Strict licencing policies should be adopted to monitor availability of facilities like drinking water, toilets, first aid and safety measures for workers such as protective gloves, headgear, footwear and goggles in the factories.
 4. Provision of alternate sources of fuel such as petroleum gas should be provided with a view to stop coal consumption, thus reducing pollution levels and at the same time enhancing quality of production.

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