



## Industrial Dust and Its Effects on the Human Body

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**Annotation:** The work studied the classification of types of industrial dust. An event to combat industrial dust. The characteristic of the impact of dust on the human body, which can be the cause of diseases, is given. Methods and means of protection against dust are widely covered.

**Keywords:** Occupational diseases, harmful factors, industrial dust, silicosis.

Industrial dust is one of the widespread adverse factors that have a negative impact on the health of workers. A number of technological processes are accompanied by the formation of finely divided particles of a solid substance (dust), which enter the air of industrial premises and remain suspended in it for a more or less long time.

In recent years, large public service establishments have appeared (super- and hypermarkets, service centers, beauty salons, exhibition complexes, customer service halls for financial enterprises), in which the movement of large human and commodity flows creates an increased dust content in the premises.

According to the generally accepted classification, all types of industrial dust are divided into organic, inorganic and mixed. The first, in turn, are divided into dust of natural (wood, cotton, linen, wool, etc.) and artificial (dust of plastics, rubber, resins, etc.) origin, and the second - into metal (iron, zinc, aluminum, etc.). .) And mineral (quartz, cement, asbestos, etc.) dust. Mixed types of dust include coal dust containing particles of coal, quartz and silicates, as well as dust generated in chemical and other industries.

The specificity of the qualitative composition of dust determines the possibility and nature of its action on the human body. The shape and consistency of dust particles are of certain importance, which largely depend on the nature of the source material.

So, long and soft dust particles are easily deposited on the mucous membrane of the upper respiratory tract and can cause chronic tracheitis and bronchitis. The degree of harmful effects of dust also depends on its solubility in body fluids. The high solubility of toxic dust enhances and accelerates its harmful effects.



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The adverse effects of dust on the body can cause diseases. Usually, specific (pneumoconiosis, allergic diseases) and non-specific (chronic respiratory diseases, eye and skin diseases) dust lesions are distinguished.

Among the specific occupational dust diseases, a large place is occupied by pneumoconiosis - lung diseases, which are based on the development of sclerotic and related other changes caused by the deposition of various types of dust and its subsequent interaction with the lung tissue.

Among the various pneumoconiosis, the greatest danger is silicosis associated with prolonged inhalation of dust containing free silicon dioxide ( $\text{SiO}_2$ ). Silicosis is a slow-moving chronic process that usually develops only in individuals who have worked for several years in conditions of significant air pollution with silicon dust. However, in some cases, a more rapid onset and course of this disease is possible, when in a relatively short period of time (2~4 years) the process reaches the final, terminal stage.

Industrial dust can also have a harmful effect on the upper respiratory tract. It has been established that as a result of many years of work in conditions of significant air dusting, a gradual thinning of the nasal mucosa and the posterior pharyngeal wall occurs. At very high concentrations of dust, marked atrophy of the turbinates, especially the lower ones, as well as dryness and atrophy of the mucous membrane of the upper respiratory tract is noted.

The development of these phenomena is facilitated by the hygroscopicity of dust and the high air temperature in the premises. Atrophy of the mucous membrane significantly disrupts the protective (barrier) functions of the upper respiratory tract, which, in turn, contributes to the deep penetration of dust, i.e. damage to the bronchi and lungs.

Industrial dust can penetrate the skin and into the openings of the sebaceous and sweat glands. In some cases, an inflammatory process may develop. It is not excluded the possibility of ulcerative dermatitis and eczema when the skin is exposed to the dust of chromium-alkaline salts, arsenic, copper, lime, soda and other chemicals.

The action of dust on the eyes causes the occurrence of conjunctivitis. The anesthetic effect of metal and tobacco dust on the cornea of the eye is noted. It has been established that professional anesthesia in turners increases with experience.

A decrease in the sensitivity of the cornea causes late negotiability of workers regarding the ingress of small fragments of metal and other foreign bodies into the eye. In turners with a long experience, multiple small opacities of the cornea are sometimes found due to injuries caused by dust particles.

Effective prevention of occupational dust diseases involves hygienic regulation, technological measures, sanitary and hygienic measures, personal protective equipment and therapeutic and preventive measures.



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The basis for carrying out measures to combat industrial dust is hygienic regulation. Compliance with the maximum permissible concentrations (MPC) established by GOST is the main requirement for preventive and current sanitary supervision.

Systematic monitoring of the state of the dust level is carried out by laboratories of sanitary and epidemiological supervision centers, factory sanitary and chemical laboratories. The administration of enterprises is responsible for maintaining conditions that prevent the excess of the MPC of dust in the air.

When developing recreational activities, the main hygienic requirements should be imposed on technological processes and equipment, ventilation, construction and planning solutions, rational medical care for workers, and the use of personal protective equipment.

Methods and means of protection against dust:

- Introduction of continuous technologies with a closed cycle (use of closed conveyors, pipelines, casings);
- Automation and remote control of technological processes (especially during loading and unloading and packaging operations);
- Replacement of powdered products with briquettes, pastes, suspensions, solutions;
- Wetting of powdered products during transportation (showering);
- Transition from solid fuel to gaseous or electric heating;
- Application of general and local exhaust ventilation of premises and workplaces;
- Use of personal protective equipment (glasses, gas masks, respirators, overalls, shoes, ointments).

Therapeutic and preventive measures. In the system of recreational activities, medical control over the health of workers is important. In accordance with the current rules, it is mandatory to conduct preliminary (upon admission to work) and periodic medical examinations.

The main task of periodic examinations is the timely detection of the early stages of the disease and the prevention of the development of pneumoconiosis, the determination of professional suitability and the implementation of effective therapeutic and preventive measures.

Among the preventive measures aimed at increasing the body's reactivity and resistance to dust damage to the lungs, the most effective is UV irradiation, which inhibits sclerotic processes; alkaline inhalations that contribute to the sanitation of the upper respiratory tract; breathing



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exercises that improve the function of external respiration; diet with the addition of methionine and vitamins.

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