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Influence of Dust on the Human Body

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Abstract: *This article notes that the presence of dust in the air is one of the urgent problems. The types of dust, their influence on the human body and their consequences are given. The directions of measures to combat the formation of dust in the air are also indicated.*

Keywords: *dust, atmosphere, aerosols, natural dust, artificial dust, tabocco dust.*

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Main body: At all times, the presence of dust in the atmosphere haunted mankind. And that is one of the urgent problems. The formation and separation of dust is observed in almost all branches of industry, transport and agriculture. In general, the types of dust particles can be divided into natural and industrial particles depending on their origin.

Problem statement: Natural dust includes those particles that are formed in nature without human intervention. Such dust is formed as a result of erosion of eroded layers of sand and soil under the influence of wind and strong storms, dust of flora and fauna, volcanic eruptions, burning of meteorites and other space objects exposed to the earth's atmosphere from space. Artificial dust is dust that is formed in industrial installations and structures as a result of direct or indirect human impact [1]

Research method: The research consists of collecting statistical data and analyzing them.

Results: It has been established that in large cities for every cubic meter of air there are about 6,000 dust particles of various sizes (some sources include vehicle emissions of about 30,000 particles), which in fields and gardens decreases by 10 times, and in mountainous areas this figure is even less.

Dust particles can be classified according to their size, i.e., they can be divided into 3 groups (i.e. dispersion composition):

a) Dust larger than 10 mill microns. Usually such dust particles fall to the ground under their own weight.

b) Dust ranging in size from 10 mill microns to 0.25 mill microns. These dust particles are called fine or microscopic dust particles. They can land on the surface under certain favorable conditions, such as rain, snow and dew, if they get stuck in heavy particles falling to the ground..

c) Dust particles smaller than 0.25 microns are called ultramicroscopic, and they never land, but fly in accordance with the rules of Brownian motion.

In the United States, when coal is burned in thermal power plants, the amount of dust emitted into the atmosphere after cleaning the filters is 180,000,000 tons per year. The prescribed norm for the amount of dust emitted by the metallurgical industry is 150,000,000 tons per year, and the actual amount of dust emitted for this industry is 120,000,000 tons.[5]

Table 1 Permissible norms of dust in the air.

№	Substance	Allowable limit millimicrons	Safety class
1	Aluminum and its alloys	2	4
2	Fuel gasoline	100	4
3	Aston	200	4
4	Aminaplasts	6	3
5	Carbon monoxide	20	4
6	Manganese	0.3	2
7	Flint dust	1	3
8	Ammonia	20	4
9	Copper dust	1	2
10	Lead dust	0.01	1
11	Phenoplasts	6	3
12	Ozone	0.1	1
13	Tobacco dust	3	3
14	Dust from plants and animals	4	4

Sanitary standards for the design of industrial enterprises (SN-275-71) establish the permissible limits for air change in industrial premises. [2]

The shape of dust particles is spherical, flat and others. During the formation of aerosols, most of the condensation of dust particles has a round shape. The shape of the particles affects the stability of the aerosol and its state in the body. Sharp-edged dust particles injure the lungs.

Dusts such as fiberglass, asbestos mica can cause micro traumas to the cells of the upper respiratory tract, affect the mucous membranes of the eyes and skin. The main harm of dust for the human body is primarily damage to the respiratory system: bronchitis, pneumoconiosis or general damage. The size of the dust determines its persistence in air, the ability to penetrate the respiratory tract and the depth of penetration. Particles with a size of 10-20 microns land on the ground at a certain speed under the influence of gravity. When inhaled, they enter the upper respiratory tract. About 60-70% of ultramicroscopic particles in the inhaled air are retained in the lungs.[4]

Conclusion: According to the labor code of the Republic of Uzbekistan, workers undergo a medical examination before starting work. People with pulmonary tuberculosis, diseases of the upper respiratory tract and bronchi, cardiovascular and other diseases are not allowed to dusty work. To ensure a safe and healthy working environment, the amount of dust in the air of industrial premises should not exceed the permissible level. Measures to combat the formation of dust in the workplace and its harmful effects on the human body should be carried out in the following areas:

1. Improvement of technological processes that completely exclude dust formation;
2. Installing special ventilation to remove dust from dust ducts;

3. Wet room cleaning;
4. Providing employees with a full range of sanitary facilities;
5. Provision of workers with anti-dust respirators, helmets, goggles, protective ointments.[3]

Dust is an integral part of the man-machine-production system, and humanity can only take measures to combat it. Because it is impossible to completely get rid of dust. It is important to pay attention to personal protective equipment's in the workplace. After all, it is personal protective equipment that prevents respiratory diseases, which are more often caused by dust.

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