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# INVESTIGATION OF THE PROCESS OF SUBSIDIZING AND FIXING INSOLVENT DEMANDS IN INDUSTRIAL ENTERPRISES OF THE NAMANAGAN AREA

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**Annotation.** Namangan region is associated with high air circulation and high levels of dust in the process of production of towels in the ART SOFT TEX GROUP industry. The airflow that is released into the atmosphere from cyclones and other systems is carried out at all factories.

**Keywords:** dust, cyclone, leaf, moisture, density, fiber, pressure, speed, process, damage, viscosity.

**Аннотация.** Наманганская область связана с высокой циркуляцией воздуха и высоким уровнем пыли в процессе производства полотенец в промышленности ART SOFT TEX GROUP. Поток воздуха, выделяемый в атмосферу циклонами и другими системами, осуществляется на всех заводах.

**Ключевые слова:** пыль, циклон, лист, влажность, плотность, волокно, давление, скорость, процесс, повреждение, вязкость

**Аннотация.** Наманган вилояти АРТ SOFT TEX GROUP саноатида сочиқ ишлаб чиқариш жараёнида ҳаво айланишининг юқорилиги ва чанг даражасининг юқорилиги билан боғлиқ. Циклонлар ва бошқа тизимлар томонидан атмосферага чиқариладиган ҳаво оқими барча заводларда амалга оширилади.

**Калит сўзлар**: чанг, циклон, барг, намлик, зичлик, тола, босим, тезлик, жараён, шикастланиш, қовушқоқлик

## INTRODUCTION.

In our country, the ART SOFT TEX GROUP uses one-step air cleaning. The cyclones of different design are used as dust suppressors, which are very efficient in cleaning the air and meeting the modern environmental requirements. The level of air purification using cyclones is in the range of 91.5-95.6%. The efficiency of the dust retention process is achieved in various ways [1]. First, the required separation intensity is achieved by applying a multistage gas cleaning method. Secondly, it is achieved with the use of high-speed devices operating in different hydrodynamic modes. Thirdly, physicochemical treatment of dusty, gaseous flow is achieved (for example, aggregation using superficial surfactants, modification of wall walls of the apparatus).

The design of the walled dust retaining apparatus has been developed to improve the efficiency of solid particle capture and to reduce hydraulic resistance


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and to simplify the design [2]. The medium and large fraction of dust is used as a filtering medium. At the same time, the filtration material, combined with thin dispersed dust, is lowered under the influence of gravity and collected on a vacuum cleaner, removed and used at an appropriate time.

Enhancement of the filter regeneration process is accomplished by giving a constant or time pure particle loading. This in turn ensures that the unit operates continuously without any additional regeneration section. The use of such filters makes 95-98% efficient air purification.

The main reason why moisture treatment is not applied is that fiber powder, containing various compounds and bacteria, is easily soluble in water and cannot be disposed.

Acoustic air treatment does not apply to fibrous dust. The use of this sound and ultrasonic generator requires special insulation, and the generator is effective when the dust concentration is high.

The rate of deposition is important for the system and the device, where solid particles mix in the gaseous environment.

Also, the particle size increase is uniform, with the increase in dust flow rate in the range 5:17 (+/-0.2) m/s, which is followed by a decrease. Decrease in magnification efficiency can be explained by the simultaneous increase in high air velocities, along with an outflow flow that contributes to the absorption of the aggregate. For a ball-shaped body, this velocity can be calculated from the equilibrium condition of theoretical body mass and the force of resistance in the air:

$$\omega_{i\tilde{n}} = 3{,}62\sqrt{\frac{d_{\acute{y}} \cdot \rho_r}{\xi \cdot \rho,}} \qquad (1)$$

Here, de - optimal diameter of the sunk particle, m.

**Table 1**

**Influence of the distance between the inlet pot and the spark plug on the efficiency of increasing L/d fiber particles**

| $\frac{L}{d}$ | Fiber particles in dusty air flow, mg / m$^3$ | Effectiveness of fibrous particles in dusty air flow rate (m/s) (%) | | | | |
|---|---|---|---|---|---|---|
| | | 15 | 16 | 17 | 18 | 19 |
| 1 | 3000 | 8 | 11 | 14 | 15 | 14 |
| | 6000 | 10 | 13 | 15 | 17 | 15 |
| 2 | 3000 | 22 | 25 | 29 | 26 | 21 |
| | 6000 | 31 | 34 | 36 | 32 | 28 |
| 3 | 3000 | 49 | 53 | 56 | 52 | 49 |
| | 6000 | 56 | 59 | 62 | 59 | 56 |


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| | | | | | | |
|---|---|---|---|---|---|---|
| 4 | 3000 | 65 | 69 | 71 | 68 | 65 |
| | 6000 | 68 | 72 | 73 | 70 | 68 |
| 5 | 3000 | 66 | 73 | 74 | 71 | 67 |
| | 6000 | 73 | 75 | 77 | 71 | 69 |
| 6 | 3000 | 67 | 73 | 75 | 70 | 67 |
| | 6000 | 73 | 78 | 77 | 71 | 69 |

According to the results presented in the table, the efficiency of the fiber particle size increase from 8 to 15 to 66 - 75%, with the relative L/d increase from 1 to 5. Further increase in these parameters results in a reduction of the fiber particle size from 75 to 54%. This is explained by the relative increase in L/d, the compressive strength decreasing, given the dispersion effect of large particle particles.

High efficiency of fibrous particles is observed at the dusty air flow rate of 17-18 m/s. In addition, the concentration of fibrous particles in dusty airflow influences the magnification efficiency. For example, the maximum conversion efficiency of fibrous particles in dusty air streams of 3000 mg / $m^3$ was 72% (at = 17 m / s and at L/d = 5). At a concentration of 6000 mg / m3 of fiber-like particles, the efficiency of reproduction reached 75%. It is seen that at higher concentrations, the number of strokes of fibrous particles increases [3].

The folded fiber particles have sufficient kinetic energy to overcome the resistance of the boundary layers of the air. High dispersion particles (dz<5 μm minerals) with small kinetic energy fibers grow poorly due to lack of energy to overcome the gas layer boundary. Nevertheless, high dispersion particles (dz<5 μm) are captured by coarse dispersion particles of fiber dust. The high mobility of small particles causes them to collide at high speeds. Large particles with high energy penetrate the surface very quickly. This conclusion is supported by the study of filamentous powders selected from the dust stand test stand. Fibrous powders clash and stick together and have a lattice-like structure that enhances the efficiency of the vacuum cleaner [4].

Thus, an experimental test stand was collected to investigate the deposition and enrichment of fibrous particles. The results of airflow and fiber particle size increase are presented graphically and graphically based on the number of shovels on the stand.

**Table 2**

**The rate of deposition of a free and cohesive single-fiber powder particle in non-stationary air**

| № | The length | | Drowning time, s | The rate of free | The rate of united | |
|---|---|---|---|---|---|---|


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| | of the fiber, MM | Sedimentary diameter, MKM | free. | united. | deposition, sm/s | deposition, sm/s | Ratio $\omega_{ст}/\omega_{св}$, (R) |
|---|---|---|---|---|---|---|---|
| 1 | 0.3 | 27.7 | 83.8 | 133.1 | 1.84 | 1.27 | 0.68 |
| 2 | 0.5 | 34.9 | 61.6 | 93.9 | 2.59 | 1.74 | 0.72 |
| 3 | 1.0 | 44.2 | 37.3 | 55.2 | 4.11 | 2.81 | 0.79 |
| 4 | 1.5 | 39.3 | 46.2 | 69.4 | 3.36 | 2.25 | 0.72 |
| 5 | 3.2 | 49.7 | 29.1 | 42.1 | 5.31 | 3.69 | 0.71 |
| 6 | 4.5 | 48.5 | 32.4 | 46.5 | 4.95 | 3.40 | 0.70 |
| 7 | 6 | 46.4 | 34.4 | 50.5 | 4.52 | 3.11 | 0.70 |
| 8 | 13 | 49.7 | 30.8 | 43.2 | 5.10 | 3.63 | 0.72 |
| 9 | 24 | 48.8 | 30.5 | 42.4 | 5.22 | 3.69 | 0.73 |
| 10 | 35 | 45.9 | 36.8 | 52.6 | 4.33 | 3.05 | 0.71 |

As a result of experimental studies it was found that the rate of deposition depends on some factors. Correlation theory and linear regression were used as mathematical devices. As a result, all the major static parameters have been identified, as well as the mathematical model expression based on the studied indicators has been developed [5]:

$$\omega_{oc} = 0{,}171 \cdot d_c - 3{,}23. \qquad (2)$$

Ten samples of enlarged fiber dust particles were used for research to determine the velocity of free and consolidated large-scale dust particles. Then weighed their diameter one after the other.

The average velocity (arithmetic mean of the three obtained results) of the free and consolidated large-scale powder particles is summarized in Table 3 [6].

**Table 3**

**Average velocity obtained from the test of free and coarse-grained dust particles**

| № sample | Dust particles m, kg | Equivalent diameter, m | The rate of drowning, м/s | | Ratio $\omega_{ст}/\omega_{св}$, (*R*) |
|---|---|---|---|---|---|
| | | | $\omega_{св}$ | $\omega_{ст}$ | |
| Single particle | $0.0047 * 10^{-6}$ | $0.0276 * 10^{-3}$ | 0.017 | 0.014 | 0.64 |
| 1 | $0.4 * 10^{-6}$ | $0.89 * 10^{-3}$ | 0.85 | 0.61 | 0.72 |
| 2 | $0.7 * 10^{-6}$ | $1.18 * 10^{-3}$ | 0.98 | 0.71 | 0.73 |
| 3 | $1.0 * 10^{-6}$ | $1.33 * 10^{-3}$ | 1.01 | 0.74 | 0.73 |
| 4 | $2.8 * 10^{-6}$ | $1.88 * 10^{-3}$ | 1.31 | 0.98 | 0.75 |
| 5 | $4.4 * 10^{-6}$ | $2.18 * 10^{-3}$ | 1.37 | 1.00 | 0.73 |
| 6 | $6.8 * 10^{-6}$ | $2.52 * 10^{-3}$ | 1.57 | 1.20 | 0.77 |


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| | | | | | |
|---|---|---|---|---|---|
| 7 | $9.5 * 10^{-6}$ | $2.82 * 10^{-3}$ | 1.74 | 1.32 | 0.76 |
| 8 | $11.2 * 10^{-6}$ | $3.03 * 10^{-3}$ | 1.92 | 1.50 | 0.78 |
| 9 | $15.3 * 10^{-6}$ | $5.20 * 10^{-3}$ | 2.50 | 2.02 | 0.81 |
| 10 | $130 * 10^{-6}$ | $6.71 * 10^{-3}$ | 3.11 | 2.58 | 0.83 |

It is found that from Table 3, the coagulation factor is accelerated due to the presence of a coagulation factor in the air dusting: the rate of deposition of enlarged particles is 47-173 times greater than the particles with the diameter equivalent of 29 μm.

Table 2–3 it is shown in that the rate of particle deposition decreases when consolidation occurs. This is explained by the fact that when the particles are deposited, they cause the particles to bond with each other, because of the environment's resistance to the deposition of the particles in relation to the single particle deposition. The collision of precipitated particles is determined by the additional friction force that slows down the deposition process. In addition, the presence of the opposite effect increases the rate of deposition. This happens when a single particle moves after the next one. The average value of $\omega_{ст}/\omega_{св}$ ($R$) of the fiber particles was 0.64 and for the larger particles was 0.82.

Thus, in the case of consolidation, in practice the calculation of the rate of deposition (R) should be included as the multiplication of the value (R) in the equation.

Studies with the near-balloon shapes of fibrous dust particles have shown that their deposition rate does not affect transverse cross-sectional surfaces and increases slightly with increasing shear diameter. In addition, the rate of deposition of enlarged particles depends on the density of the particles. Therefore, we found that the rate of deposition of particles depends on their density. Based on the test results, it was found that the deposition rate depends on some factors.

Preliminary investigations indicate that the object under investigation has a linear nature, which depends on the rate of particle deposition rate on their injection density.

Therefore, we used correlation theory and linear regression as a mathematical device. As a result, all the key static parameters were determined, as well as the expression of the mathematical model related to the studied indicators

$$\omega_{in} = 0{,}7593 + 0{,}0312 \cdot \rho_H + 0{,}0403 \cdot \rho_H^2,$$

Here $\omega_{oc}$ is the rate of drowning dust particles m/s; deposition of dust particles, m/s $\rho_H$ - Density of dust particles, kg/m$^3$; *0,7593*, *0,0312* and *0,0403* The coefficients are found in the regression equation.


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