DOI: 10.12737/article_590878fb0c7798.56722718

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8, 11]

$$M^2 \quad 1 \; \frac{dw}{w} \quad \frac{k}{a^2}dE \qquad \frac{1}{a^2}dE \quad 0 , \qquad (1)$$

M =w/a;

dx

w

a

k

(

5,10].

G

$$\mathrm{Re} \quad \frac{4G}{D}, \qquad (2)$$

Re

; *G* *D*

dx

$$dPs \quad \frac{3}{8} C_x (w \quad u)^2 \; \frac{Gdx}{ur_{\ t}}, \qquad (3)$$

d s

u C_X

$C_X = f(Re\ )$; T_0

x

; *r*

t 3.

$$dE \quad \frac{w^2}{2} K \; \frac{dx}{D}, \qquad (4)$$

K

$$K \quad \frac{3}{4} \frac{C_x}{} \frac{(1 \quad j)^2}{j} \frac{}{_t} \frac{D}{r}, \qquad (5)$$

$= f(Re)$; *j*

$j = u/w$

f , 3.

w,	*j*	*u*,		$T_0(j,\ )$	*a* ,	
100	0.10	10.0	0.031	308.15	321.3	0.0
110	0.15	16.5	0.051	308.15	321.3	0.0
120	0.20	24.0	0.075	308.14	321.3	0.0
130	0.25	32.5	0.101	308.12	321.3	0.0
140	0.30	42.0	0.131	308.07	321.2	0.0
150	0.35	52.5	0.163	307.98	321.2	0.0
160	0.40	64.0	0.199	307.82	321.1	-0.1
170	0.45	76.5	0.238	307.56	321.0	-0.1
180	0.50	90.0	0.280	307.14	320.7	-0.2
190	0.55	104.5	0.325	306.51	320.4	-0.3
200	0.60	120.0	0.374	305.59	319.9	-0.4
210	0.65	136.5	0.425	304.28	319.2	-0.6
220	0.70	154.0	0.479	302.46	318.3	-0.9
230	0.75	172.5	0.537	300.03	317.0	-1.3
240	0.80	192.0	0.598	296.82	315.3	-1.9
250	0.85	212.5	0.661	292.70	313.1	-2.5
260	0.90	234.0	0.728	287.52	310.3	-3.4

T_0=const

a =const.

)

$$T_0(u) \quad T_{01} \quad \frac{1}{Cp} \quad \frac{u^2 \quad u_1^2}{2}, \qquad (6)$$

T_0 p

$u=j \;\; a$

$$T_0 \quad \frac{T_{01} \quad \frac{u_1^2}{Cp \;\; 2}}{1 \quad \frac{k}{Cp \; k \quad 1} R^{\;\;2} j^2}, \qquad (7)$$

R

R

w/a_k; a_k

[3, 12,14]

$$T \quad (\;\; T_0 \quad \frac{k \quad 1}{k \quad 1} \;^{2} \;\; T_0, \qquad (8)$$

T

$$M^2 \quad 1 \; \frac{dw}{w} \quad k \; \frac{M^2}{2} \frac{dx}{D} \quad \frac{M^2}{2} K \; \frac{dx}{D} \quad . \qquad (9)$$

$z=x/D$

$$\frac{d}{dz} \quad \frac{k}{k \quad 1} \quad \frac{}{k} K \; \frac{^3}{1 \quad ^2}. \qquad (10)$$

$$\frac{1 \quad ^2}{^2} \frac{d}{} \quad \frac{k}{k} \; \frac{dx}{D}. \qquad (11)$$

$$\frac{4 \;\; r^3}{3} \;_t \frac{du}{dt} \quad \frac{}{2} C_x \;\; r^2 \quad w \quad u \;^2 \quad \frac{r^3}{3} \; \frac{dw}{dt} \quad \frac{r^3}{3} \; \frac{d \;\; w \quad u}{dt}. \qquad (12)$$

t

$$\frac{du}{dt} \quad \frac{3}{8} C_x \frac{}{_t} \frac{w \quad u \;^2}{r} \quad \frac{}{_t} \frac{dw}{dt}. \qquad (13)$$

$j=u/w$

w/a_k

$z,$

$$\frac{dj}{dz} \quad \frac{3}{8} C_x \frac{}{_t} \frac{1 \quad j \;^2}{j} \frac{D}{r} \quad \frac{j}{} \frac{d}{dz}. \qquad (14)$$

C_x

$$\frac{d}{dz} \quad \frac{k}{k \quad 1} \quad \frac{}{k} K \; \frac{3}{1 \quad 2},$$
$$\frac{dj}{dz} \quad \frac{1}{2} K \quad \frac{j}{} \frac{d}{dz} \qquad (16)$$

$z \;\; L/D$ L

G,

1

G

D

$$\mathrm{Re}_c \quad \frac{8rG(1 \quad j)}{D^2}, \qquad (15)$$

Re .

-

$j(0)=j1$ $L/D)=$ $_2$

P $_2)= P(L/D)=P_a$.

$_0$

$$_0 \quad \frac{}{_t}, \qquad (17)$$

$_0$

^{3}.

$= \quad _0$

P

$$P \quad \frac{G\sqrt{T_0}}{mFy(}, \qquad (18)$$

P

m m=0,0404,

1 0,5; F

2; y

$$P_p \quad \frac{P}{}, \qquad (19)$$

P_p

$$_0 \quad . \qquad (20)$$

$$\frac{G}{a_k F}, \qquad (21)$$

$$G \quad {}_1 {}_1 w_1 \quad {}_2 {}_2 w_2 \quad {}_1 {}_1 a_{k\ 1} \quad {}_2 {}_2 a_{k\ 2}, \qquad (22)$$

$$G_t \quad (1 \quad {}_1 \quad {}_t u_1 \quad {}_2 \quad {}_t u_2, \qquad (23)$$

$$\frac{1}{} \quad \frac{}{{}_t\ j} \quad \frac{P}{RT\ {}_t\ j}, \qquad (24)$$

G_t

$$\frac{1}{1 \quad \frac{}{{}_t\ j}}, \qquad (25)$$

$w_i(z_i)$

$u_i(z_i)$ $_i(z_i)$

$P_i(z_i)$ $_i(z_i)$ $_i(z_i)$,

$_i(z_i)$

$_i(z_i)$

$j(z)$

(z)

P

$$P \quad \frac{P_0 \quad P_a}{1}, \qquad (26)$$

P_0 P

P P ,

L

D

d_s=

P_0=0,5-5

$_t$=2650

3 = 3

d_c=334

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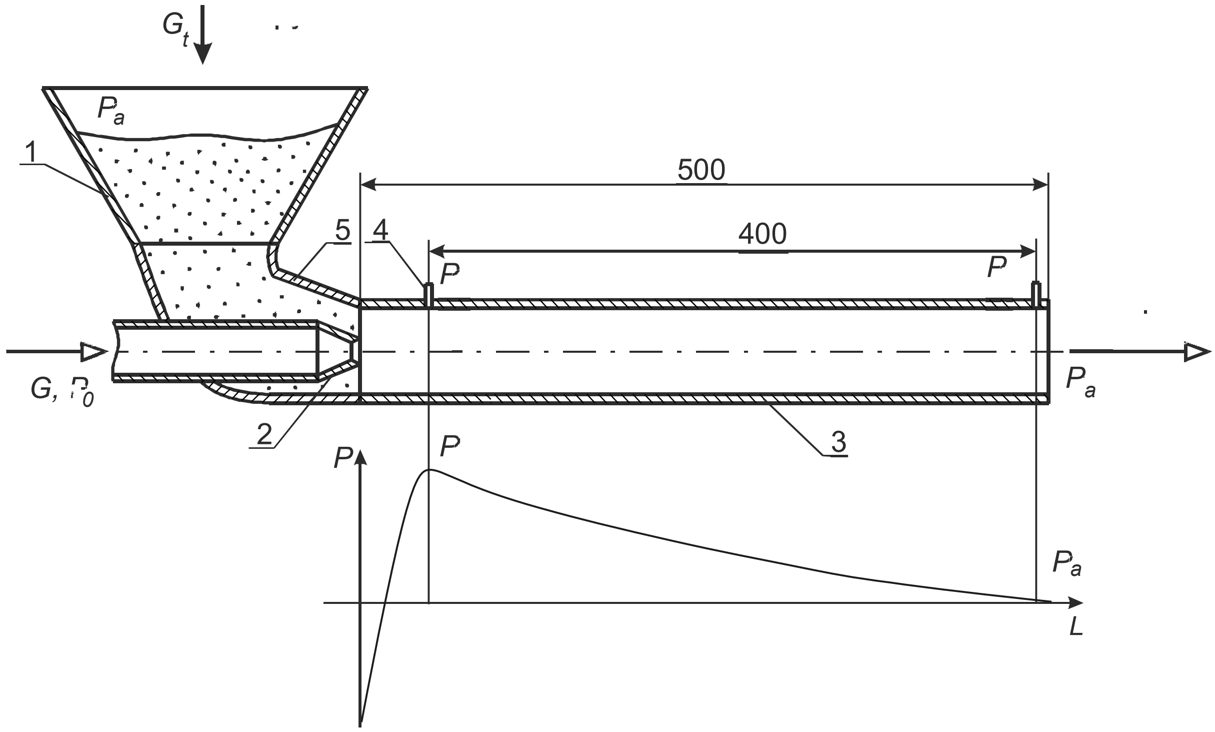
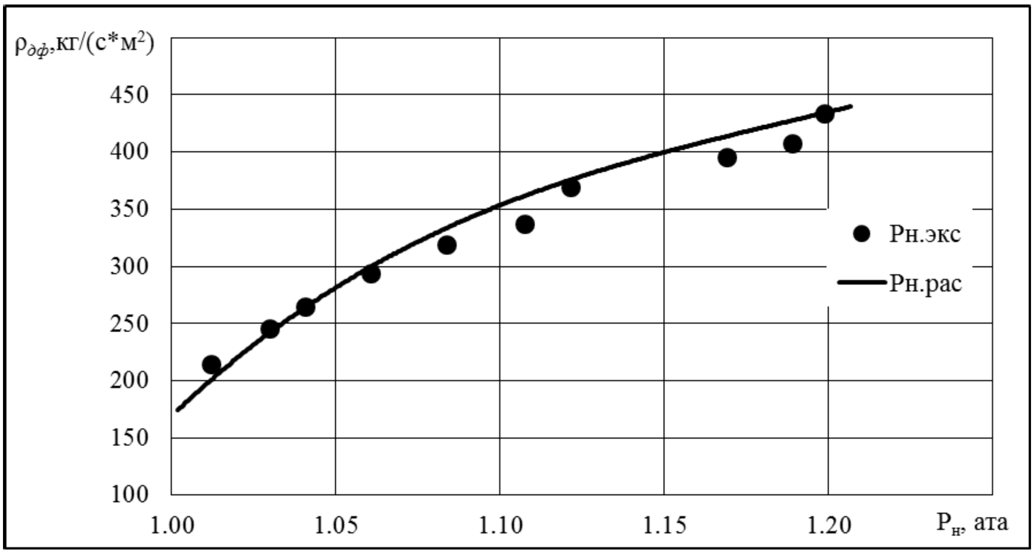


$$\frac{(G \quad G_t)}{F}, \qquad (27)$$

2).

	P_0	G	Gt		, 2)	P	P
1	0.5	0.0095	0.0286	3.020	215.215	1.012	1.019
2	1.0	0.0132	0.0303	2.298	246.096	1.030	1.030
3	1.5	0.0165	0.0303	1.839	264.750	1.041	1.042
4	2.0	0.0198	0.0323	1.631	294.467	1.061	1.056
5	2.5	0.0231	0.0333	1.445	319.205	1.083	1.073
6	3.0	0.0264	0.0333	1.264	337.859	1.107	1.091
7	3.5	0.0297	0.0357	1.204	369.987	1.121	1.114
8	4.0	0.0330	0.0370	1.124	396.126	1.169	1.140
9	4.5	0.0363	0.0357	0.985	407.295	1.189	1.164
10	5.0	0.0396	0.0370	0.936	433.434	1.199	1.197

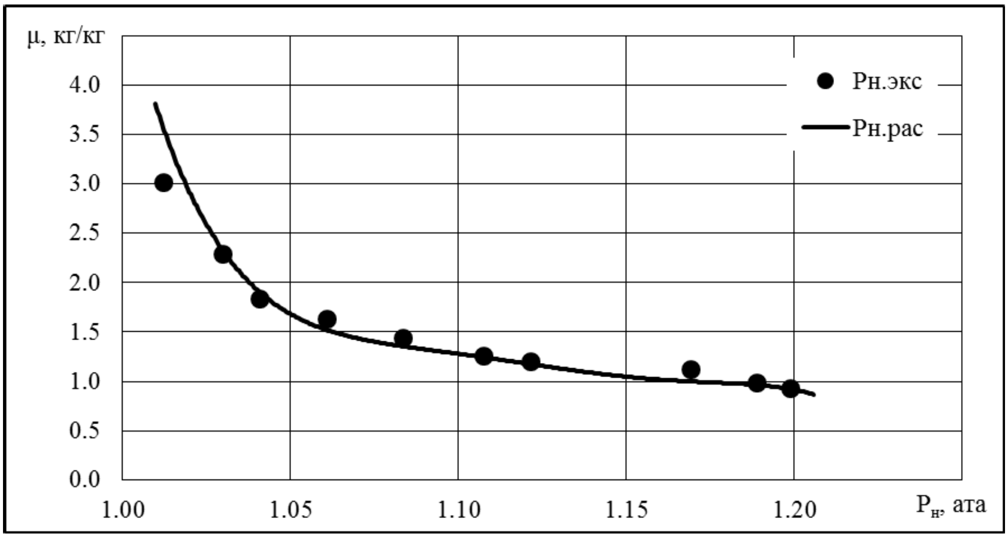
P .



ρдф,кг/(с*м2)
450
400
350
300
250
200
150
100
1.00
1.05
1.10
1.15
1.20
Pн, ата
Рн.экс
Рн.рас

P

P .



μ, кг/кг
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1.00
1.05
1.10
1.15
1.20
Pн, ата
Рн.экс
Рн.рас

P

1.

56

3.

4.
-

5.

6.

7.

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187.

X

204.

10.

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- -

- -230.

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- -

- 233.

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128.

Barakovskikh D.S., Shishkin S.F.

MOVEMENT OF TWO-PHASE FLOW IN ACCELERATING TUBE OF THE JET MILL

Two-phase movement process in accelerating tube of the jet mill has been considered. The equations system in the framework of one-dimensional movement of the compressive gas has been obtained. The system in question allows the main parameters of the acceleration process i.e. velocity and solid particles concentration, diameter required and the accelerating tube length to be determined at the beginning of the tube acceleration and gas consumption, depending on pressure. From this solution, it follows that the two-phase flow density depends on pressure at the beginning of the accelerating tube and this pressure dependence is of universal character. The experimental investigations of the two-phase acceleration flow process carried out have confirmed adequacy of the mathematical model suggested and the character of the two-phase flow density dependence from the original pressure.

Key words: *jet mill, accelerating tube, movement equation, original pressure, gas flow consumption, particles velocity, two-phase flow density.*

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