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This work is devoted to the aerodynamic improvement of elements of centrifugal compressor stages, which is topical because of their use in compressors of modern gas turbine engines. The aim of this work is to construct a technique for aerodynamic improvement of centrifugal compressor stage inlet guide vanes based on a numerical

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– 2019. – 3.

2.

[7, 8]

$$y(x) \quad (0 \leq x \leq 1, \quad y(0) = y(1) = 0),$$

$$\delta(x) \quad (0 \leq x \leq 1),$$

$$\left(\begin{array}{l} \beta \\ x=0 \\ l. \end{array} \right) \quad (\quad);$$

$$\beta, \quad l \quad \delta(x)$$

$$y^*(x) = y(x)(1 + \xi), \quad 0 \leq x \leq 1, \quad (1)$$

$$y^*(x) -$$

$$y(x) \quad ; \quad \xi - \quad y ($$

(1)

$$\eta_{p.k.}^*$$

$$\pi_{p.k.}^* .)$$

$$\hat{\eta}_{p.k.}^* = \frac{2}{G_{\max} - G_{\min}} \int_{G_{\min}}^{\frac{G_{\min} + G_{\max}}{2}} \eta_{p.k.}^* dG,$$

$$\hat{\pi}_{p.K.}^* = \frac{2}{G_{\max} - G_{\min}} \int_{G_{\min}}^{\frac{G_{\min} + G_{\max}}{2}} \pi_{p.K.}^* dG, \quad (2)$$

$(G_{\min}, G_{\max}) -$

[9].

ξ (1)

$$\xi_h = 2\xi_{h \max}(x_1 - 0,5),$$

$$\xi_m = 2\xi_{m \max}(x_2 - 0,5), \quad (3)$$

$$\xi_t = 2\xi_{t \max}(x_3 - 0,5),$$

$h, m \quad t$

; \max

$(x_1, x_2, x_3) -$

[10] (

$x_1 = x_2 = x_3 = 0,5$).

$\xi_{h \max}, \xi_{m \max}, \xi_{t \max}$ (3)

9°.

ξ

16

(2).

20 × 20 × 82

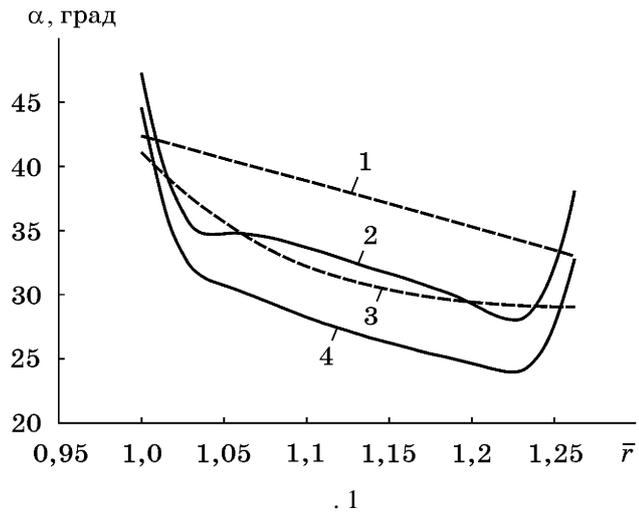
0,2 %
 , 0,1 %.
 12×12×72 (,) .

$\hat{\pi}_{p.k.}^*$, $\hat{\eta}_{p.k.}^*$
 G_{max}
 (1).

	x_1	x_2	x_3	$\Delta\hat{\pi}_{p.k.}^*, \%$	$\Delta\hat{\eta}_{p.k.}^*, \%$	$\Delta G_{max}, \%$
1	0,500	0,500	0,500	0,0	0,0	0,0
2	0,250	0,750	0,250	-0,3	0,1	-1,8
3	0,750	0,250	0,750	0,4	0,0	1,9
4	0,125	0,625	0,875	-0,1	0,2	-1,3
5	0,625	0,125	0,375	1,1	0,0	4,1
6	0,375	0,375	0,625	0,4	0,0	1,3
7	0,875	0,875	0,125	-0,7	0,0	-4,1
8	0,063	0,938	0,688	-0,6	0,2	-4,4
9	0,563	0,438	0,188	0,2	-0,1	1,1
10	0,313	0,188	0,938	0,7	0,1	3,0
11	0,813	0,688	0,438	-0,4	-0,1	-2,6
12	0,188	0,313	0,313	0,7	0,0	2,9
13	0,688	0,813	0,813	-0,6	0,1	-4,4
14	0,438	0,563	0,063	0,1	0,0	0,2
15	0,938	0,063	0,563	1,0	-0,1	4,0
16	0,031	0,531	0,406	0,2	0,1	0,6

5,
 $\hat{\pi}_{p.k.}^*$ G_{max} .
 . 1
 , (1 3), (2
 4).
 ,
 . 1 2
 , 3 4 -
 5 .

[1],



(20×20×120)
2 4 (.1).

