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[1-11], [10,11]

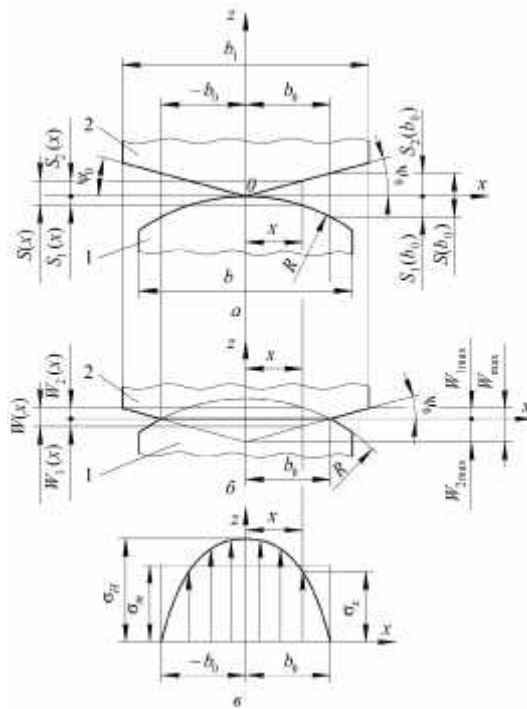
[1],

[10, 11].

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$F_n$ ,  $V_1, V_2$

[10,11].



$S(b_0) = b$

$$S(b_0) = S_1(b_0) + S_2(b_0), \quad (1)$$

$$S_1(b_0) = b_0^2/2R; S_2(b_0) = \psi_0 b_0 - \dots$$

$$\psi_0 = \frac{\Psi}{4(\pi-2)} \left[ \pi + \left( 1 - \frac{\pi\alpha_w}{2} \right) \frac{mz \cos \alpha_w}{R} \right],$$

$\alpha_w = 20^\circ$ ;  $m$ ;  $R$ ;  $z$ ;  $\psi$

$$S(x) = S_1(x) + S_2(x), \quad (2)$$

$$S_1(x) = x^2/2R; S_2(x) = \psi_0 x - \dots$$

(1) (2)

$W(x)$

$$W(x) = W_1(x) + W_2(x) = [S_1(b_0) - S_1(x)] + [S_2(b_0) - S_2(x)] = \frac{b_0^2 - x^2}{2R} + \psi_0(b_0 - x). \quad (3)$$

$W_1(x)$ ;  $W_2(x)$ ;  $\sigma_H < 120$ ;  $\sigma_H > 120$

$$W_1(x) = (b_0^2 - x^2)/2R$$

$W_1(x)$ ;  $\sigma_H < 120$ ;  $\sigma_H > 120$ ; (3) [10,11]

$$W(x) = \frac{b_0^2}{2R} \sqrt{1 - \frac{x^2}{b_0^2}} + \psi_0 b_0 \left( 1 - \frac{x}{b_0} \right). \quad (4)$$

$W(x)$

$W(x)$

[11],

$$W(x) = W_1(x) + W_2(x), \quad (5)$$

$$W_1(x) = A_1(x); W_2(x) = A_2(x) \cdot \omega(x) - \dots$$

(5)

$$W(x) = A(x) \cdot \omega(x). \quad (6)$$

$$\sigma_m = \frac{F_n}{2b_0 h_p} \quad (7)$$

$h_p = 2c^* m = 1,6m -$  ;  $c^* = 0,8 -$

$$W = C_m \sigma, \quad (8)$$

$$W = \frac{C_m F_n}{2b_0 h_p} \quad (9)$$

$$\sigma_1 = \frac{\varepsilon E_1}{1 - \nu_1^2} = \frac{E_1}{1 - \nu_1^2} \cdot \frac{\Delta L}{L}; \quad \sigma_2 = \frac{\varepsilon E_2}{1 - \nu_2^2} = \frac{E_2}{1 - \nu_2^2} \cdot \frac{\Delta L}{L}, \quad (10)$$

$$\left. \begin{aligned} W &= 2C_{m1} \sigma_1 = 2C_{m1} \frac{E_1}{1 - \nu_1^2} \cdot \frac{\Delta L}{L} = \frac{C_{m1} E_1}{1 - \nu_1^2} \cdot \frac{\Delta L}{b_0}; \\ W &= 2C_{m2} \sigma_2 = 2C_{m2} \frac{E_2}{1 - \nu_2^2} \cdot \frac{\Delta L}{L} = \frac{C_{m2} E_2}{1 - \nu_2^2} \cdot \frac{\Delta L}{b_0}. \end{aligned} \right\} \quad (10)$$

$$C_{m1} = C_{m2}, \quad C_{m1} + C_{m2} = C_m.$$

$$C_{m1} = \frac{(1 - \nu_1^2) b_0}{E_1}; \quad C_{m2} = \frac{(1 - \nu_2^2) b_0}{E_2} \quad (10)$$

$$\delta_1 = 2 \frac{C_{m1} \sigma_{m1}}{F_n} = \frac{1 - \nu_1^2}{2E_1 h_p}; \quad \delta_2 = 2 \frac{C_{m2} \sigma_{m2}}{F_n} = \frac{1 - \nu_2^2}{2E_2 h_p} \quad (11)$$

$$A = 2b_0 (\delta_1 + \delta_2) = \frac{b_0}{h_p} \left( \frac{1 - \nu_1^2}{E_1} + \frac{1 - \nu_2^2}{E_2} \right) = \frac{b_0}{h_p} \quad (12)$$

$$W(x) = A \cdot \omega(x) = \frac{b_0}{h_p} \omega(x) \quad (13)$$

$$A \int_{-b_0}^{b_0} \omega(x) dx = AF_n = \frac{F_n b_0}{h_p} = \frac{b_0^2}{2R} \int_{-b_0}^{b_0} \left( 1 - \frac{x^2}{b_0^2} \right) dx + \psi_0 \int_{-b_0}^{b_0} (b_0 - x) dx = \frac{2b_0^3}{3R} + \psi_0 b_0^2 \quad (14)$$

$$\frac{2b_0^2}{3R} + \psi_0 b_0 - \frac{F_n}{h_p} = 0,$$

$$b_0 = 0,75 \sqrt{\frac{8 RF_n}{3h_p} + (\psi_0 R)^2 - \psi_0 R}. \quad (15)$$

(6),

$$W(x) = A \cdot \omega(x) = A \frac{h_p}{h_p} \omega(x) = Ah_p \sigma(x), \quad (16)$$

$$\sigma(x) = \omega(x)/h_p - \quad (16) \quad (3)$$

$$\sigma_H = \frac{b_0^2 + 2\psi_0 b_0 R}{2Rah_p}. \quad (17)$$

(17)

$$\sigma_H = 0,375 \sqrt{\frac{8F_n}{3Rh_p} + \left(\frac{\psi_0}{\pi}\right)^2} + 0,625 \frac{\psi_0}{\pi}. \quad (18)$$

$$v_1 = v_2 = v \quad 1 = 2 = \quad (15) \quad (18) \quad :$$

$$b_0 = 0,75 \sqrt{\frac{16(1-v^2)RF_n}{3Eh_p} + (\psi_0 R)^2 - \psi_0 R}; \quad (19)$$

$$\sigma_H = 0,375 \sqrt{\frac{4EF_n}{3(1-v^2)Rh_p} + \left[\frac{\psi_0 E}{2(1-v^2)}\right]^2} + 0,3125 \frac{\psi_0 E}{1-v^2}. \quad (20)$$

$$\psi_0 = 0 \quad v = 0,3,$$

(19) (20) :

$$b_0 = 1,622 \sqrt{\frac{RF_n}{Eh_p}}; \quad (21) \quad \sigma_H = 0,454 \sqrt{\frac{EF_n}{Rh_p}}. \quad (22)$$

$$(21) \quad (22) \quad , \quad [10]$$

(4)

$$(3). \quad (13),$$

(14)

$$A \int_{-b_0}^{b_0} \omega(x) dx = \frac{F_n b_0}{h_p} = \frac{b_0^2}{2R} \int_{-b_0}^{b_0} \sqrt{1 - \frac{x^2}{b_0^2}} dx + \psi_0 b_0 \int_{-b_0}^{b_0} \left(1 - \frac{x}{b_0}\right) dx = \frac{\pi b_0^3}{4R} + \psi_0 b_0^2.$$

$$\frac{\pi b_0^3}{4R} + \psi_0 b_0^2 - \frac{F_n}{h_p} = 0,$$

$b_0$

$$b_0 = 2 \sqrt{\frac{F_n R}{\pi h_p} + \left(\frac{\psi_0 R}{\pi}\right)^2 - \frac{\psi_0 R}{\pi}}. \quad (23)$$

(13) (23)

(17),

$$\sigma_H = \sqrt{\frac{F_n}{\pi R h_p} + \left(\frac{\psi_0}{\pi}\right)^2} + \frac{(\pi-1)\psi_0}{\pi}. \quad (24)$$

(23) (24)

$v_1 = v_2 = v$

$$1 = 2 = , \quad :$$

$$b_0 = 2 \sqrt{\frac{2(1-v^2)RF_n}{\pi E h_p} + \left(\frac{\psi_0 R}{\pi}\right)^2 - \frac{\psi_0 R}{\pi}}; \quad (25)$$

$$\sigma_H = \sqrt{\frac{EF_n}{2\pi(1-v^2)Rh_p} + \left[\frac{\psi_0 E}{2\pi(1-v^2)}\right]^2} + \frac{(\pi-1)\psi_0 E}{2\pi(1-v^2)}. \quad (26)$$

$$(25) \quad (26) \quad v = 0,3 \quad \psi_0 = 0,$$

:

$$b_0 = 1,522 \sqrt{\frac{RF_n}{Eh_p}}; \quad (27) \quad \sigma_H = 0,418 \sqrt{\frac{EF_n}{Rh_p}}. \quad (28)$$

(27) (28)

(21), (22) (27), (28)

$W_1(x)$

$$1,655/1,522 = 0,454/0,418 = 1,086$$

[8],

$$\psi = (2,5; 5,0; 7,5; 8,7) \cdot 10^{-3} \quad ; m = 6 \quad ; z = 40; \alpha_w = 20^\circ; h_p = 9,6 \quad ; b = 40$$

$$; b_1 = 50 \quad ; R = 3000 \quad ; v = 0,3; E = 2,1 \cdot 10^5$$

$$\psi_0 = (1,72; 3,44; 5,16; 5,99) \cdot 10^{-3} \quad ;$$

$$18 \quad ; \sigma = 1150 \quad ; \sigma = 850 \quad .$$

(25) (26)

(28).

$$b_0 \quad \sigma_H \quad \psi_0 = \psi = 0, \quad (27)$$

$$\psi_0 = 5,99 \cdot 10^{-3} \quad \sigma_H$$

$$\psi = 8,7 \cdot 10^{-3} \quad (5006-55),$$

$$\sigma_H = 707,6 \quad [8]$$

$$\sigma_H = (0,75 \dots 0,9) \cdot \sigma = (0,75 \dots 0,9) \cdot 850 = 637,5 \dots 765$$

$$\sigma_H = 637,5 \dots 765$$

$$\psi_0 = 5,99 \cdot 10^{-3} \quad \psi = 8,7 \cdot 10^{-3}$$

$$\sigma_H = 707,6$$

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$$\sigma_H = 707,6$$

	$\psi \cdot 10^3$ ,	0,0	2,5	5,0	7,5	8,7
	$\psi_0 \cdot 10^3$ ,	0,00	1,72	3,44	5,16	5,99
	$2b_0$ ,	9,27	4,80	2,95	2,08	1,81
	$\sigma_H$ ,	82,20	244,66	425,3	615,3	707,6

$\sigma_H$

2 .

0,6 /  $b_0$  0,8.

$b_0$

2

$\sigma_H$

1.

$\psi_0 = 45^\circ = 0,785$

$2b_0 = 0,0144$      $\sigma_H = 90580$

1.

( )

$2b_0$

2.

3.

1,25...1,65

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