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Vessels and apparatus. Norms and methods of strength calculation. Calculation of shells and heads from influence of support loads

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[F] —

IF],. IF\3, [F]<sub>3</sub> —
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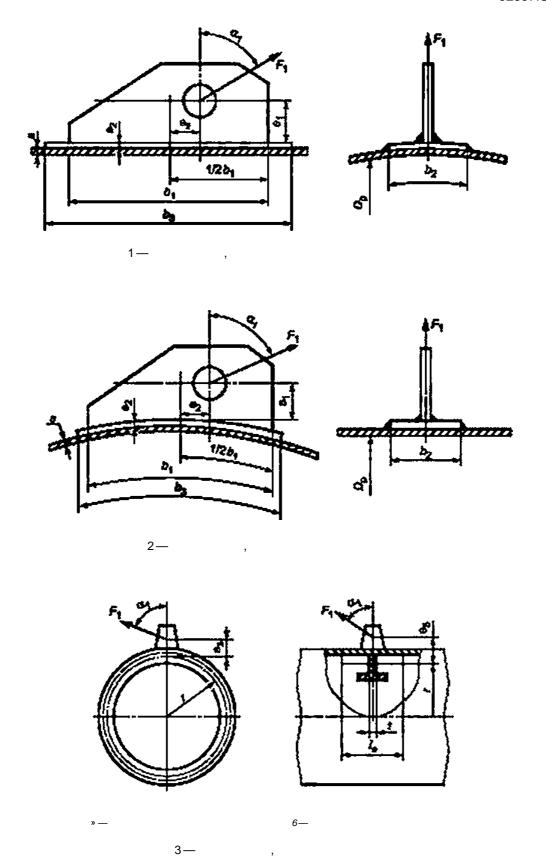
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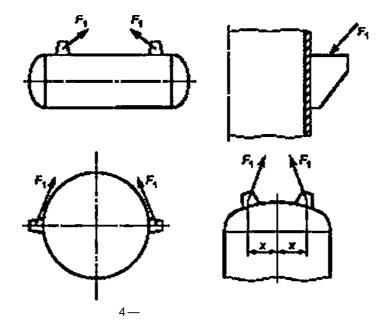
5.4.4.6.4.4. 6.4.8, 7.5.2.1. , 0 ^{&2} KjNV ® 2<0 $0_2 = |dj\{,$ ^£> s. 4.3, 5.4.4, 5.4.5, 6.4.4.6.4.8.7.5.2.1.< = 1. 4.3 4.3.1 $4\{\overline{S} - 1\} - r^{(S-C)} \left(F \pm \frac{4M}{\Omega_p} \right).$ (3) 4.3.2 (4) 4.3.3 (5) ° - ~ 2(s -)' 4.3.4 « · $\frac{£3l}{2(s}$ (6) 4.3.5 £> (7) () cos ' »® : (9)< > = 0.25: (11) 5

1-4.

4

5.1





5.2

5.2.1 ,
$$\frac{s-c}{\rho_p}$$
 \$ 0.05.

₃ 1.50,. s₂ a s. 5.2.2

5.2.3

, — 0£ £0.4D.

F' ~ 2 8«,'

5.4 , 5.4.1

**[/*].-
$$\frac{[0,1(5 -)^{2}]}{(6K_{3}C0SOj| '^{Kjjsino}, ^{ } ||}$$
 (13)

5.4.2

(14)

5.4.3 , 5 6. :

^_ I&1 — : 1*5 — :

*K*_s :

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• ;

- min (exp (1.0882 - 1.4216 + 0,26544lnz + 1.11lnx) 1:2.0):

• ; (15)

= min (exp (1.0848 - 2.0892 + 0.32775lnz + 1.09lnx) 1; 1.8).

 $\frac{2b_2}{D_p}$; z= 2(s-c)

5.4.4 (oj— (1), , -

•

= 0.2: $)_2$ (2). $. < j_{mv}$ (5):

• ,= 0.3:

(2). , (3) (4).

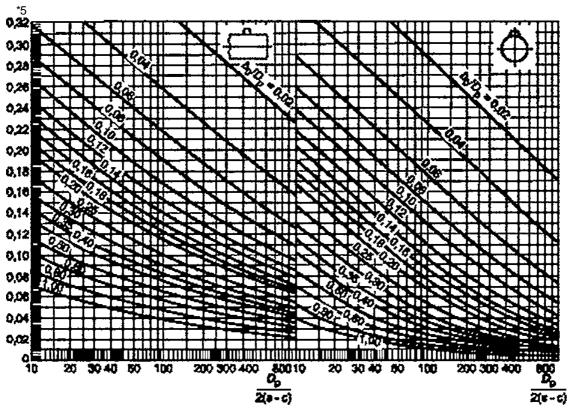


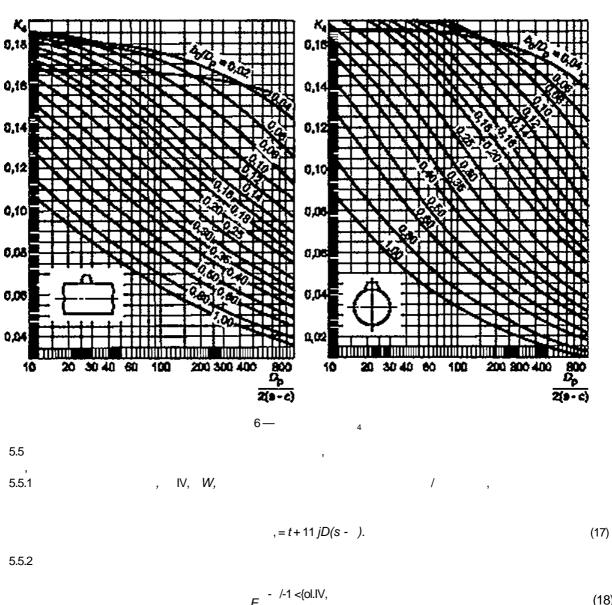
Рисунок 5 — Козффициент K_3

, (6).

5.4.6 *0 :

2,09()— ,

t92[<?)— , (16)

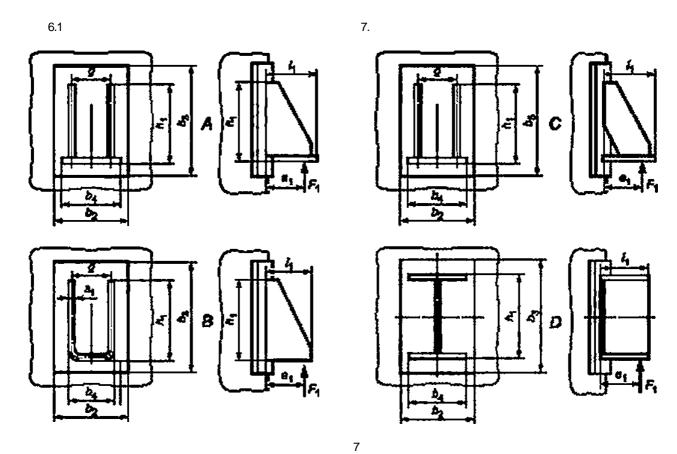


F, - /-1 <{ol.IV, (18)

Jcos sin²;;

(19)

[],>(), [].



6.2 6.2.1 . -

6.2.2

s 0,05.

9*0.2/),.

0.04 s A s 0.5.

0.04<£-<0.5.

0.04 S & £ 0.8.

₂*0.6 ₃.

₃ ^ 1.5ft,.

S₂*S.

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6.3
6.3.1
                                      2(,+$*5) -2 =4
                           F,
                                                                                                              (20)
                                 3 0.75[ -2[(01+5+5)_2]^{*3}
                                 , =
6.3.2
6.3.3
             — 4.
(
                                      F_1 = \frac{G}{4} + \frac{1}{D^* 2\{ , +s + Sg\}'}
                                                                                                              (21)
6.4
6.4.1
                                                                                                              = (22)
        f<0<sub>1</sub>5 [F],.
                                                                             [0.5 + £).
                                                   (22).
6.4.2
                                                                                                      VV
6.4.3
             , = ((-5.964 - 11,395 - 18.984 - 2.41 - 7,286 - 2.042y* + 0.1322 <sup>3</sup>
                            +0.4833 2 0.8469 +1.428 ) 10- ].
                                                                                                              (23)
                     expl(-26.791 - 6,936* - - 3503 <sup>2</sup> - 3357 4 2.786 <sup>2</sup> 4
                          4 0.2267 <sup>3</sup> 4 02831 4 0.3851 <sup>2</sup> 4 1370 <sup>3</sup>)10<sup>12</sup>]
             min(
                         ((-5.964 - 11395 - 18584 - 2.413 <sup>2</sup> - 7286 - 2 142 <sup>2</sup> 4
                                                                                                             (24)
                           4 0.1322 3 4 0.4833 2 4 0.8469 2 4 t428y3)10'2],
                = [(-29.532 - 45.958 -91.7592 -1.801 -12.062 2 -18.8722? 4
                             4 0.1551 3 4 1.617 22 4 3,736 4 1.425Z3) 10-*).
                                                                                                             (25)
*=| (2( )) \text{\sigma} \text{\sigma} z_\in \text{\sigma}
                   (1).
6.4.4 (oj —
               , = 0.3; ft? — (2). ,
                                         (3)
                                                   (4)
6.4.5
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< 1-

(26)

* = * =

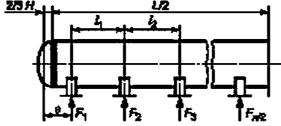
6.4.8 [oj — (1). , = 0.4; $_2$ — (2). 8^, .— (5).

7

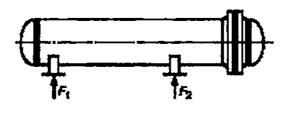
7.1. 8 9.



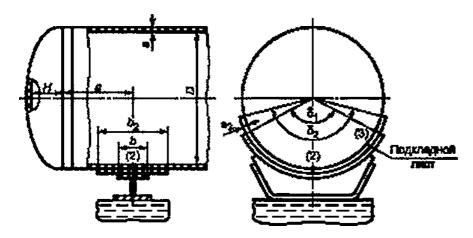
25 H_{-1 L} 1/2



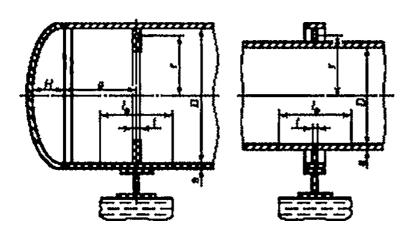
б — сосуд, опирающийся симметрично на три или более опоры



8—



 в — цилиндрическая обочайка, не подкреппенная элементами жесткости



6— , *

9—

7.2 7.2.1 :

60*56,5180*.

5 0.05.

S₂£S.

6, *.

 $a < s -) ^D(s -).$

7.3.1

. -

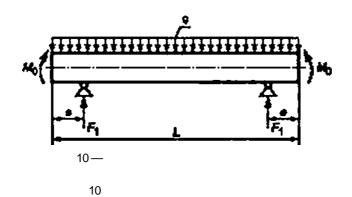
,

12

10

7.3

52857.5-2007



<u>. G</u> L.*H (28)

(29)

7.3.2 F, 10.

F^f. (30)

7.3.3 , M_{ν} , Qj.

. , 10. ,

$$_{2} = S|i-M_{0}.$$
 (31)

, i , 10. -

$$_{,2} = - _{,(^{N})^{-}|(|^{*}|)^{2}}.$$
 (32)

, 10. -

7.4

$$\max (M_{v}) > \max \{ \}. \tag{34}$$

7.4.1 ,

 $\frac{4(s-)}{D^*(s-)} = \frac{4^*}{D^*(s-)} = 5[] < .$ (35)

 M_{v} — 7.3.3;

52857.S-2007

 $_{9} = \max \{1.6 - 0.20924 (-1) + 0.028702 (-1) 0.4795-10^{-3} \{-1\} - 0.028702 (-1) 0.4795-10^{-3} (-1) - 0.028702 (-1) 0.4795-10^{-3} (-1) - 0.028702 (-1) 0.4795-10^{-3} (-1) - 0.028702 (-1) 0.4795-10^{-3} (-1) - 0.028702 (-1) 0.4795-10^{-3} (-1) - 0.028702 (-1) 0.4795-10^{-3} (-1) - 0.028702 (-1) 0.4795-10^{-3} (-1) - 0.028702 (-1) 0.4795-10^{-3} (-1) - 0.028702 (-1) 0.4795-10^{-3} (-1) - 0.028702 (-1) 0.4795-10^{-3} (-1) - 0.028702 (-1) 0.4795-10^{-3} (-1) - 0.028702 (-1) 0.4795-10^{-3} (-1) - 0.028702 (-1) 0.4795-10^{-3} (-1) - 0.028702 (-1) 0.028702 (-$ - 0.2391-1 *6 (-1) - 0.29936- -2 (-1) 2 - 0,85692-10-6 { -1) * 0,88174-10-6 (-1) -0,75955-10-» ?(-1) + (36) $0,82748-10^{-4}(-1)^{-3}+0,4816810^{-9}(-1)$ »: 1.0}, » —;* L (s-) L *1'0_ <37> 7.4.2 (38) {/] " : () — 7.5 (2) (3) (. 9). 7.5.1 -2.83-£^ 5 (39), = 0.91(40) (41) 7.3.3. 7.5.2 7.5.2.1 F, £ min [FJj}. (42){F]₂ —) [F)j—

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OSle.-I*JD(S-CHS-C)
                                                                                                                                             44
                                                               *14 *16 "17
                                                                                              (1).
(«,]<sub>2</sub>. [ajj —
                                                                                                  1. 0<sub>2</sub>
               2,
         1
                            0.23K,j K,j
                                                                                                            (PD g ) 1
1,4 (s - ) °mxJK<sub>2</sub>W
                                 ,2 ,
                              0,53 ,,
                                                                                                                   P° 1
2(5-c)K<sub>2</sub>H
[0;
                                                                             0
                                                                                                                     e'^sinp.
                                                                                                                                 ;0.2 |).
                                                                                  (_{10} = max)
                                                                                                1.15-0.1432$,,
                                                                       ( ,2
                                                                                                   $1 (0.56,)
                                                                                                    1.45-0.43$,,
                                                                      (
                                                                                                     8 (0.5$,)
                                                                                 (,_3 = 1 -
   7.5.2.2
                                                     +\frac{|M_i|}{|M|} + \frac{|F_i|}{|F|} + \left(\frac{Q_i}{|Q|}\right)^2 \cdot 1.0
                                                                                                                                            (45)
 =0-
  []
                                                                                                         );
   F, —
                                                          .*/_ , ,5.
                                                                                                                                            (46)
                                                                                               max<t7 -
                                                                  ( 13
                                                                                                     sin{0.56,)
                                                                              (,_5 = min); ^{0.6.4}+
                                                                                                                                      |);
                                                                                                         1- '^ ,. ,. <u>'</u>-
                                                                              ( "
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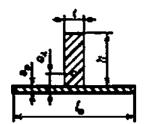
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7.5.3 7.5.3.1 7.5.2.1. : £>? &2, b (s-) S_{et} (47) 7.5.2.2. 7.6 7.6.1 7.6.1.1 $4(\overline{s-c}) + \frac{AM.}{xD^2(s-)}SW.$ (48)М— 7.3.3. (45). -0 = 0.7.6.1.2 ^* *0. (45). 7.6.2 <<u>. ?</u> -(0.50**,)' (49)2; 2 5, ^4»'« . 7/977777/ 60* 14 90* 21 20 120* 33 26 56 50 150* 180* 103 (MJ. ₄— 3(4>0). 4 =(s-)^1- $\frac{1}{2(\sqrt[4]{-e})MjM,'}$ (50)

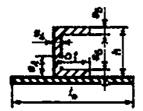
$$1 - t + 4 \text{ }^{j}D\{s - \}.$$
 (51)

3

1«)



$$\frac{64 \$5 \cancel{1} ^{\$4} U S_{e}}{2 \$4} = 0 15 \{s_{4} (-e_{4})^{2} + s_{4} ej + (2b - 2e_{4} + s_{5}) 6_{4} \%5 + (2e_{4} + s_{e}) / s_{e} \} (0j,$$



$$\frac{b^*4 - U^{\underline{s}}\underline{c}}{2s a} \qquad \qquad 05|_{s_4} (A - e_4) + 2/Ss (A - S5) + <2e_4 + *)/««»] |o].$$

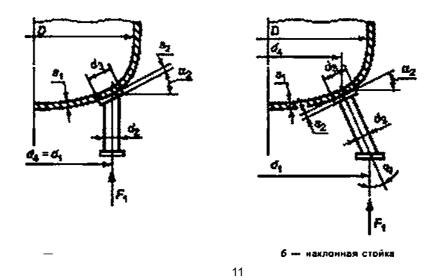
, 3. (M.J *

$$(Mr! » Wp [al.$$
 (52)

8

8.1

52857.S-2007



8.2 8.2.1 , , , , -

8.2.2 , , -

8.2.3 $d_3Z1,6d_2$.

8.2.4

, — 0 < < 0.4 *D*. 8.3

8.3.1

F,
$$\begin{cases} \$ + 07557 \sim \text{Anflr}, = 3 > \\ \text{fi} \quad 1 \quad . \qquad 4. \\ 12 \text{ of }_{4} \end{cases}$$
 (53)

8.3.2 -4. (, , , . .),

8.3.3

,

3 > OT5rf7" "3

8.4 8.4.1

$$\frac{F_1 - p \frac{nd^2}{4}}{[F]_1} + \tag{56}$$

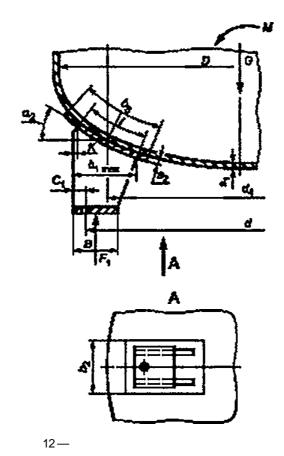
$$\{F], -$$
 , (58);
$$\int_{0}^{1} d_{3} -$$
 ; (58);
$$[] -$$
 52857.2. 8.4.2

«<u>2</u>

8.4.3

	* 0.2SD			
	²⁰) () 1 +2		0.9 D	0.8
sin ctj		<si 2</si 	1.8 5	**

9		
9.1 9.2 9.2.1	12 .	*
9.2.2	:	
	0,003 <^<0,02,	
	£*0,7,	
	0,1 < £ 5 0,35,	
	₃ * 1,2/.	
	*0.6 ₃ .	
	s _: *s _t .	



9.3 9.3.1

9.3.3

F, ${}^{+0755}$ = 3' (59)

9.3.2 = 4.

+ *(60)

Ab- .< vv -) tei)

9.3.4

 $F = \frac{\text{orb -1 " "" = 3-}}{4}$ (62)

:

f > = 3' > / 4.

9.4 9.4.1

F,
$$\sin a$$
? Mi |F1, + $\frac{\rho}{[\rho]} \le 1$, (64)

[] — 52857.2;

4. 9.4.2

[F], = 0.25 [) (s, -)* (0.2
$$d_t(D)$$
. (65)

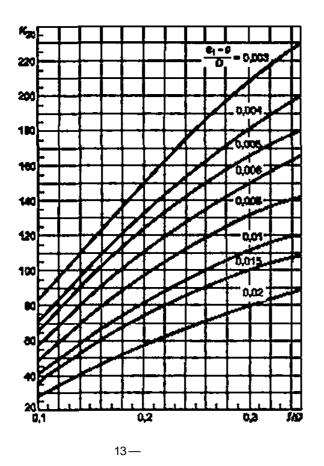
 d_t —

$$d_t - d^* 2$$
 ,- - , (66)

9.4.3

$$(,=0.25_{21} (]{s,-}) D(0.2 d_t/).$$
 (67)

9.4.4 (s, -) / D // D.



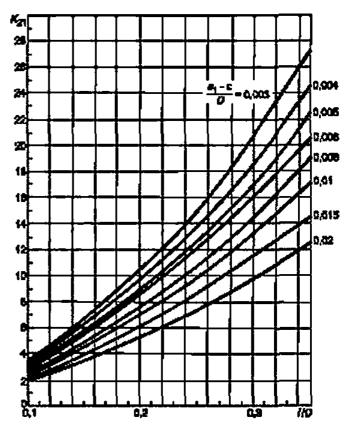


Рисунок 14 — Коэффициент К21

9.4.5

(68)

9.4.6

IF], = 0.25
$$_{20}$$
 $_{32}$ [a] $(s_t$ -)* $(0.2$ $d_A!$ D). (69)

9.4.7

$$(MJ = 0.25 , () (, - D(0.2 d, /£>).$$
 (70)

9.4.8 K_{J2} , 15 ^ -

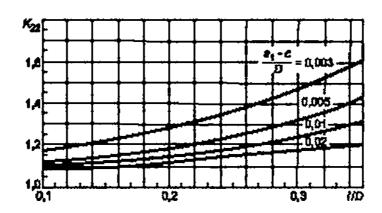


Рисунок 15 — Коэффициент K_{22}

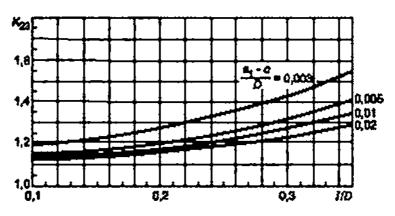


Рисунок 16 — Коэффициент K_{23}

66.023:006.354 71.120 02 361500 75.200

; ,